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1   IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS

2   MARSHALL DIVISION

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 3   TQ DELTA, LLC.,                    (  CAUSE NO. 2:21-CV-310-JRG
                                       )
 4            Plaintiff,               (
                                       )
 5   vs.                               (
                                       )
 6   COMMSCOPE HOLDING COMPANY,        (
     INC., et al.,                     )  MARSHALL, TEXAS
 7                                     (  MARCH 22, 2023
              Defendants.             )  8:30 A.M.
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VOLUME 4

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TRIAL ON THE MERITS

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13   BEFORE THE HONORABLE RODNEY GILSTRAP
UNITED STATES CHIEF DISTRICT JUDGE

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1   THE COURT: Be seated, please.

2   Are the parties prepared to read into the record those

3   items from the list of pre-admitted exhibits used during

4   yesterday's portion of the trial?

5   MR. WILSON: Yes, Your Honor.

6   THE COURT: All right. Please proceed.

7   MR. WILSON: Your Honor, Ty Wilson on behalf of the

8   Plaintiff TQ Delta. And on Tuesday, March 21st, 2023, TQ

9   Delta admitted the following exhibits at trial: Exhibit 26,

10   Exhibit 122, and Exhibit -- strike that. 135-B.

11   THE COURT: All right. Is there any objection to

12   that rendition from the Defendants?

13   MS. RIOLO: No, Your Honor.

14   THE COURT: What's the Defendants' corresponding

15   rendition?

16   MS. RIOLO: Mary Riolo on behalf of the CommScope

17   Defendants. On Tuesday, March 21st, 2023, CommScope admitted

18   Exhibit 62.

19   THE COURT: Any objection from Plaintiff?

20   MR. WILSON: No, Your Honor.

21   THE COURT: Does that complete this offering from

22   both sides?

23   MR. WILSON: Yes, Your Honor.

24   MS. RIOLO: Yes, Your Honor.

25   THE COURT: Thank you very much.

1   Plaintiff, are you prepared to call your next witness?

2   MR. DAVIS: We are, Your Honor.

3   THE COURT: All right. Let's bring in the jury,

4   please.

5   (Whereupon, the jury entered the courtroom.)

6   THE COURT: Good morning, ladies and gentlemen.

7   Welcome back. Please have a seat. It's good to see you.

8   We'll continue with the Plaintiff's case in chief. And

9   at this time I'll ask Plaintiff to call their next witness.

10   MR. DAVIS: Your Honor, Plaintiff calls Dr. John

11   Putnam to the stand.

12   THE COURT: All right. Doctor Putnam, if you'll

13   come forward and be sworn by the Courtroom Deputy, please.

14   Mr. Fink, if this is your witness, you can go to the

15   podium and prepare for direct.

16   (Whereupon, the oath was administered by the Clerk.)

17   THE COURT: Please come around, have a seat on the

18   witness stand.

19   All right, counsel. You may proceed with direct

20   examination.

21   JONATHAN PUTNAM Ph.D., SWORN,

22   having been duly sworn, testified under oath as follows:

23   DIRECT EXAMINATION

24   BY MR. FINK:

25   Q.   Would you please introduce yourself to the jury, please,

1   sir?

2   A.   Yes. My name is Jonathan Putnam.

3   Q.   And, Doctor Putnam, have you prepared an opinion in this

4   case on the amount of damages owed by CommScope?

5   A.   I have, yes.

6   Q.   And did you prepare an expert report in this case?

7   A.   Three reports, yes, several hundred pages.

8   Q.   And have you prepared slides to assist in explaining your

9   opinion today?

10   A.   I have.

11   Q.   Doctor Putnam, what is your area of expertise?

12   A.   I'm an economist, and I specialize in the valuation of

13   intellectual property rights like the patents that are at

14   issue in this case.

15   Q.   How long have you worked in that area?

16   A.   Over 40 years.

17   Q.   And, Doctor Putnam, would you briefly summarize your

18   education after high school, please?

19   A.   Yes. I went to Yale, and I received a B.A. in economics.

20   Then I returned to Yale for graduate school and received a

21   Master's degree and a Ph.D. degree, also in economics.

22   Q.   And have you taught in the area of valuing intellectual

23   property?

24   A.   Yes. I was a Professor of Law at the University of

25   Toronto. I've also taught at Yale, at Columbia University, at

1   Vassar College, and at Boston University.

2   Q.   And have you published on intellectual property as well?

3   A.   Yes. Many articles. One of them on valuing patent

4   rights has been cited about a thousand times in subsequent

5   scientific literature.

6   Q.   And have you testified before in intellectual property

7   cases such as this one?

8   A.   Yes.

9   Q.   About how many times?

10   A.   About a hundred.

11   Q.   And, Doctor Putnam, in your testimony, do you work mainly

12   for patent holders like TQ Delta or mainly for accused

13   infringers like CommScope?

14   A.   I work about half and half for each side.

15   Q.   And, Doctor Putnam, what materials did you -- sorry.

16   Doctor Putnam, does the amount that you receive in this

17   case depend in any way on what the jury decides?

18   A.   No. My firm gets paid the same either way.

19   Q.   And, Doctor Putnam, what materials did you consider in

20   rendering your opinion?

21   A.   Well, there's a wide variety of them. I obviously read

22   the patents at issue in this case. I read the complaint and

23   the answers filed by the parties. I looked at the documents

24   that are produced. There's, you know, many thousands of pages

25   of financial reports, sales information, and descriptions of

1   the products at issue.

2   There's market reports on DSL and on the cost of

3   installing DSL and other means of bringing broadband to the

4   home we'll talk about.

5   So, yes, as I said, several thousand pages.

6   Q.   And, Doctor Putnam, at a high level, what is your

7   opinion?

8   A.   The reasonable royalties that are owed by CommScope to TQ

9   Delta for the infringement of TQ Delta's patents is $89.1

10   million.

11   Q.   And, Doctor Putnam, overall, what economic problem did

12   you address in this case?

13   A.   Well, the overall problem is -- it's really got four

14   parts. First of all, we have to look at TQ Delta's RAND

15   promise, which the jury has heard a lot about. Second, we

16   have to measure the damages for CommScope's infringement.

17   Third, we need to examine the licenses that CommScope and TQ

18   Delta and Aware have entered into. And, finally, we need to

19   measure the compensation for CommScope's holdout, which I'll

20   explain later.

21   Q.   And so, Doctor Putnam, did you take Aware and TQ Delta's

22   RAND promises into account in your opinion?

23   A.   Of course.

24   Q.   And does TQ Delta have a RAND obligation on every patent

25   in this case?

1   A.   No.   There are seven patents that are being asserted.   TQ

2   Delta says that five of them are essential.

3   Q.   And do you know why that is?

4   A.   Because you only have a RAND promise if the patent that

5   you are asserting is essential to a standard.   If it's not

6   essential, then there is no RAND obligation.

7   Q.   And have you reviewed the technical reports of TQ Delta's

8   experts in this case related to what patents are or are not

9   essential?

10   A.   Yes.

11   Q.   And, Doctor Putnam, were you familiar with RAND

12   commitments and essential patents before this case?

13   A.   Yes.

14   Q.   And how are you familiar with those issues?

15   A.   Well, I've testified on these cases many times, at least

16   25, on standard essential patent and RAND or FRAND

17   obligations.

18   Q.   And, Doctor Putnam, are standard essential patent cases

19   and the valuations the same as traditional patent cases?

20   A.   Well, there are similarities and differences.

21   Q.   And at a high level, what are those similarities?

22   A.   Well, the similarities are that you've got an innovation,

23   and you're trying to figure out the benefit of that innovation

24   over something else.   So that's just characteristic of every

25   patent case.

1   And then in patent cases, you need to measure the damages

2   from the infringement of that patent right and to figure out a

3   royalty or other measure of damages.

4   Q.   And I guess, at a high level, what are the differences?

5   A.   Well, there's -- the differences are important. So

6   at -- in a standard case, you don't have an option not to use

7   the patent. If you're going to practice the standard, you

8   have to practice that patent.

9   Because you have to practice it, you don't have an

10   alternative, then you have an obligation to price your patent

11   fairly. You can't jack up the price just because everyone has

12   to use it.

13   So the other important difference is that standards are

14   created by many different people. And so when you're working

15   on a particular case, like this one for TQ Delta, you have to

16   figure out TQ Delta's part of the standard and its

17   contribution to the overall value.

18   Q.   And, Doctor Putnam, overall, what did you do to account

19   for the RAND promises of TQ Delta?

20   A.   Well, there's really three things. There's two sort of

21   concepts that are important and then one practical

22   investigation.

23   The first concept is that RAND means RAND -- reasonable

24   and non-discriminatory terms and conditions. So we've heard a

25   lot about the terms, but it's important to emphasize the

1   conditions also. So what's a condition? It's like a senior

2   citizen discount. If you're a senior citizen, then you get a

3   discount on going to the movies or whatever. Everybody over

4   65 gets a discount. That's non-discriminatory. If you're not

5   over 65, you don't meet the condition, you don't get the

6   discount.

7   So in this case that matters because, for example, we've

8   heard about an early mover discount. If you're not an early

9   mover, you don't get the early mover discount.

10   Q.   And, Doctor -- I'm sorry. Go ahead.

11   A.   There was a second concept I want to make sure I got

12   across.

13   Q.   Please explain the second concept, sir.

14   A.   Sorry. The second concept that's important is that RAND

15   refers to the obligation to be prepared to license on

16   reasonable and non-discriminatory terms. So it's an offer

17   going forward, looking into the future, about the terms on

18   which one party can use another party's patents.

19   That's very different from what we're doing in this case,

20   which is damages. Damages is compensation for infringement

21   looking backwards in time and infringement that's already

22   occurred because there was no license.

23   So a RAND obligation and damages are unrelated.

24   Q.   And what did you find in considering the RAND, I guess,

25   offers made by TQ Delta?

1   A.   Well, the -- so on this chart that's on the screen, I've

2   looked at TQ Delta's offer to CommScope and compared that in

3   several important dimensions with the actual licenses that TQ

4   Delta has entered into with CommScope's competitors because we

5   want so see whether the offer that TQ Delta made looking

6   forward was reasonable and non-discriminatory relative to the

7   actual licenses that CommScope's competitors entered into.

8   So here we have four important conditions of that

9   contract and that offer. And just for the reference, those

10   are Exhibits 36, 37, 39, 67, and 124.

11   So what's the region of licenses in the offers? It's the

12   same--worldwide. What's the licensed product? It's DSL

13   equipment. Did the parties agree to TQ Delta's standard rates

14   or were they offered the standard rates? Yes, they were. Was

15   there a first mover discount? Well, for the Zhone license,

16   yes. For the Zyxel license, yes.

17   In the CommScope offer, which was made around the same

18   time as these other offers, there could have been a first

19   mover discount if CommScope had been a first mover. If not,

20   then no discount. They don't meet the condition.

21   Q.   And so, overall, what was your conclusion about TQ

22   Delta's offers and the RAND promise?

23   A.   It's reasonable, and with respect to the other licenses

24   that TQ Delta has actually entered into, it's

25   non-discriminatory.

1   Q.   So, Doctor Putnam, did you then address CommScope's

2   damages for infringement after that?

3   A.   Yes.

4   Q.   And at a high level, what did you address in that

5   analysis?

6   A.   Well, we're trying to solve a -- sort of a -- this is the

7   generic part of the process. This is what you do in every

8   patent case. And so you ask a series of questions, the first

9   one being, what's the technical problem that is being solved.

10 Here, that technical problem is that telephone wires are old

11 and slow and noisy, and you can't transmit high speed internet

12 and video over them.

13   Secondly, you have to ask, well, if we could solve that

14 problem, what would be the economic benefit. And the economic

15 benefit for a phone company is the billions of dollars in

16 revenue you can charge to your subscribers if you can offer

17 them high speed internet or, conversely, avoiding the losses

18 of having those subscribers go to a cable company.

19   Then you ask, what are the ways to solve the problem.

20 Are there multiple ways to solve it? Usually there's more

21 than one way to skin a cat. You want to know the best way,

22 however. You want to know what this particular set of patents

23 does, and then you want to compare the benefit of the best way

24 to the next best way.

25   And so -- and that's the basis for the gains of the

1   patent owner, and that's -- it's on that basis of the gains

2   that the patent owner has created that you award damages.

3   Q.   And, Doctor Putnam, why did you consider the gains of the

4   invention over the alternatives?

5   A.   Well, this is -- this is really economics in its -- sort

6   of in its broad form. Everybody makes decisions to do the

7   best thing they can based on their alternatives. When you

8   walk into a grocery store, you have many alternatives you can

9   buy. What you actually put in your cart is the best

10   combination of groceries for your particular family, given

11   your needs and preferences and budgets.

12   So that's the same -- that process is called

13   optimization. And so we're looking at the optimizing process

14   of choosing the best alternative ways to bring broadband into

15   the home.

16   Q.   And what are the different ways that a customer could get

17   broadband into their home?

18   A.   Well, at this time when the standards were being

19   finalized, there were three principle ways. One of them was

20   DSL over the twisted pair copper wires, the wires that already

21   exist going into your loam.

22   One of them is to run fiber all the way to the home.

23   That's high speed cables that require actually digging a new

24   trench and going into your home and installing new wires.

25   And one of them is cable, which is -- also requires

1   digging a trench and going into your home, but that's

2   conducted by the cable company.

3   Q.   And as part of your analysis, can you give us an idea of

4   how popular those alternatives were in the United States?

5   A.   Yes. I put together a graph that shows the use of these

6   three alternatives over time from 2005, which is around the

7   time of when these standards were finalized, over the next

8   decade or so. And you can see that, over this time period,

9   DSL accounted for about 30 million households.

10   Now, of course, the number of households that received

11   broadband increased rapidly because of the increase in

12   population and new construction and also people were adopting

13   broadband as they chose to acquire high speed internet

14   services.

15   So there's growth in cable, fiber became increasingly

16   popular, but DSL was, you know, peaked as we heard yesterday

17   from Mr. Wauters around 2008 or so, and it held fairly steady

18   over the next eight or nine years.

19   Q.   And what, overall, did you learn from looking at the data

20   on the popularity of different broadband services in the

21   United States?

22   A.   Well, at the -- at the date that's relevant for this

23   case, which is CommScope's first infringement in November of

24   2008, that was about the peak time of DSL, and then gradually

25   it's become less popular, as we heard yesterday, as other

1   technologies had overtaken it. But at the time it was

2   critical for phone companies as a way to compete with the

3   cable companies so that they wouldn't lose customers or have

4   to install fiber.

5   Q.   And did you find that DSL was more or less successful

6   than it had been predicted to be?

7   A.   Well, it was actually more successful. There was

8   actually still many households in the U.S. today that use DSL,

9   and it was predicted that DSL would have a shorter lifetime

10   than it actually has had. So it's been more successful than

11   was predicted at the time.

12   Q.   And who was CommScope's main customer that bought its DSL

13   units?

14   A.   Well, as Mr. Wauters explained, AT&T.

15   Q.   Is that the phone company AT&T?

16   A.   Yeah, AT&T.

17   Q.   And, Doctor Putnam, for a company like AT&T, did you find

18   cable was an alternative?

19   A.   No. Cable is not an alternative for a phone company

20   because they use fiber technology to bring the signals to a

21   neighborhood and then they use the copper wires to take those

22   to the household. Cable, coaxial cable, is something that

23   telephone companies don't use. You know, that's mixing two

24   different technologies. So cable is not an alternative for a

25   company like AT&T.

1   Q.   And how did you find that the phone companies solved this

2   broadband access problem?

3   A.   Well, they chose different ways. So some companies chose

4   to actually bite the bullet and run fiber all the way to the

5   home. That's what Verizon did. That's the expensive choice.

6   AT&T principally chose to use DSL with its existing phone

7   lines, and it saved a lot of money by doing that.

8   Q.   And have you prepared a chart to explain this difference

9   between running DSL to the home or running -- I'm sorry,

10   running fiber to the home or using DSL?

11   A.   Yes. We've heard this several times, but I think it

12   helps to see it so we know what fiber actually means.

13   So in both cases you start with a signal at a central

14   office as shown on the left here, and then you start with

15   fiberoptic cable because that's what carries lots of

16   information at very high speeds.

17   In the case of DSL, you run that fiber to what's called a

18   neighborhood node--okay?--which is, as we heard yesterday, is

19   like a box that can sit by the side of the street or a smaller

20   office. And then the signal is transformed there, and you're

21   patched into the existing telephone network, and it goes over

22   the existing wires over to each one of the homes in the

23   neighborhood. You don't have to run new wires to every home.

24   Q.   And how did that differ for the fiber to the premises?

25   A.   Well, in contrast, so you start out the same with fiber

1   to the premises, the central office, the signal begins, you

2   run to the neighborhood, but then there is no node, you just

3   keep going all the way right to each one of the houses. But

4   then you have to dig a trench for each one of the houses, and

5   that's the expensive part.

6   Q.   And did phone companies have any alternative other than

7   DSL or fiber?

8   A.   I investigated that. And, of course, other technologies

9   eventually became available--satellite and eventually

10   wireless. But back in 2004 to 2006 when these standards were

11   being finalized, those technologies weren't available on a

12   widespread basis.

13   Q.   And, overall, did every phone company choose DSL over

14   fiber?

15   A.   No. As I said, companies made different choices, and

16   even with the same company made different choices. So that

17   Verizon principally chose fiberoptics, the expensive choice,

18   and AT&T principally chose DSL, the cheaper choice.

19   Q.   And what do you conclude from the fact that AT&T chose

20   DSL?

21   A.   Well, given its mix of subscribers and the -- you know,

22   the ranges they'd have had to run wires and that sort of

23   thing, AT&T decided that that was the best alternative, that

24   was the optimizing choice for AT&T.

25   Q.   And did CommScope sell AT&T a large number of the DSL

1   modems it used?

2   A.   Yes.

3   Q.   So, overall, about how many units of DSL products did

4   CommScope sell in this case?

5   A.   About 36.1 million.

6   Q.   And, overall, about what was CommScope's revenue for

7   that?

8   MR. DACUS: Objection, Your Honor. Relevance and

9   also violates one of the pretrial rulings.

10   THE COURT: Are you talking about an order in

11   limine, Mr. Dacus?

12   MR. DACUS: I'm not sure if it was an order in

13   limine, Your Honor, but it was one of the Court's pretrial

14   rulings that we discussed in pretrial. I'm happy to approach.

15   THE COURT: Well, I'm going to have to know more

16   specifics than that. Approach the bench, counsel.

17   (The following was had outside the hearing of the

18   jury.)

19   MR. DACUS: Your Honor, he's asking him about the

20   $3.5 billion number that Your Honor took out. They had a

21   slide on it for opening, Your Honor, but that it was not

22   relevant and overly prejudicial. He just asked that question.

23   THE COURT: There is a MIL about a party's overall

24   financial size, wealth, et cetera, but I assume this is

25   targeted just the products at issue.

1   MR. FINK: Yes, Your Honor. It's also the same

2   number that was shown to the jury yesterday by CommScope in

3   its slides.

4   MR. DACUS: We pulled it down after a nanosecond.

5   THE COURT: Overruled.

6   MR. DACUS: Thank you.

7   (The following was had in the presence and hearing

8   of the jury.)

9   THE COURT: Objection's overruled. Let's proceed.

10 Q.   (BY MR. FINK) So, Doctor Putnam, overall, what was the

11 total amount of revenue for those units that CommScope sold

12 for DSL products in this case?

13 A.   Well, for 36.1 million units at an average of $95 a unit,

14 that's about $3.4 billion.

15 Q.   And was Verizon AT&T's biggest competitor?

16 A.   Yes.

17 Q.   And did you learn anything about Verizon's decision to

18 employ fiber instead of DSL?

19 A.   Well, it was an extremely expensive decision and it

20 turned out to be more expensive than was originally thought at

21 the time. Fiber is a difficult technology to work with. And

22 so when they actually tried to install broadband to every

23 home, it was even more costly than they thought it was going

24 to be at the time, which means that the cost savings of DSL

25 relative to fiber are even greater.

1   Q.   And, Doctor Putnam, what did you do next after you

2   determined that the best available options to the phone

3   company were fiber and DSL?

4   A.   Well, you want to measure the cost savings. As I said,

5   that's the value of the innovation is how much money does a

6   company like AT&T save by choosing DSL over having to install

7   fiber.

8   Q.   And why do you want to do that?

9   A.   Because that's the measure of the innovation.

10   Q.   And is there a technical term for this difference in, I

11   guess, cost between the two benefits?

12   A.   Yes. That's called the incremental value of the

13   innovation because it's the increment or the gain over the

14   other technology that DSL provides in terms of the costs

15   saved.

16   Q.   And are there any other reasons that you looked at the

17   cost savings incremental value?

18   A.   Yes. One of the -- one of the important points about a

19   standard is that it causes all the devices that comply with

20   the standard to work together. So we heard the example of

21   like your iPhone can talk to a Samsung phone even though

22   they're made by different companies because they both operate

23   on the same standard. That's called interoperability.

24   So standards create a benefit called interoperability or

25   the value of standardization, and you want to make sure that

1   that's not included in the calculation.

2   So the way to make sure that that doesn't happen is you

3   compare two standards. In this case we're comparing one

4   standardized technology, DSL, with another, which is fiber.

5   And then when you look at the cost savings between them,

6   you're not capturing the benefits of standardization because

7   they both have standardization. So you're focusing only on

8   the cost savings created by the technology.

9   Q.   And do you have a high level example of what you're

10   talking about there?

11   A.   Sure. Suppose that are looking at two movie theaters.

12   Okay? One of them charges more than the other one and you

13   want to know why. Okay?

14   Well, one explanation could be that the more expensive

15   theater is showing a more popular movie and so they've raised

16   their prices to reflect that.

17   If you want to know what it is about the theater that

18   makes it special, then you need to make sure that you consider

19   their prices when they're both showing the same movie. So

20   that way when you look at the difference in price, you're not

21   taking -- you've already controlled for the fact that the

22   movie is not the explanation and so it must be something else

23   about those theaters.

24   Here, we want to control for the fact that there's two

25   standards and we want to eliminate the benefits of

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 1   standardization and only focus on the cost savings created by

 2   DSL technology over fiber technology.

 3   Q.   And how did you determine this incremental value between

 4   DSL and fiber?

 5   A.   Well, we looked at a number of economic studies from

 6   around this period that actually asked this exact question.

 7   Q.   And what did you learn from these studies?

 8   A.   Well, the -- you know, you can imagine that this is a

 9   hugely expensive enterprise for a phone company to install

10   either DSL or fiber.  They're both expensive.  There's

11   been -- the companies are spending billions of dollars.  And

12   so they need to estimate what it's going to cost.

13       And then people who analyze their stocks who want to know

14   whether this is a good investment are also going to be

15   projecting their costs.

16       So we looked at various reports from the industry that

17   describe the cost of installing fiber and the cost of

18   installing DSL.

19   Q.   And who conducted these studies that you looked at for

20   the cost differences between DSL and fiber?

21   A.   Well, the phone companies themselves did as well as

22   financial analysts.  We're going to look at an example from

23   Bear Stearns, which is an investment bank.  So people who are

24   trying to advise investors on the costs the companies are

25   going to incur.
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1   Q.   And, Doctor Putnam, what time period did you consider for

2   these studies about the cost differences between DSL and

3   fiber?

4   A.   We generally looked at the period 2003 to 2010 or so.

5   Q.   And why was that?

6   A.   Well, it's during this time period that the standards

7   that are at issue in this case are being finalized. VDSL is

8   approved in 2004, VDSL2 in 2006, G.bond 2005. This is also

9   the period encompassed by CommScope's first infringement in

10   November of 2008.

11   So we want to know what the economic environment is in

12   this time period and what the investment climate is, how

13   people are expecting the costs of the two technologies to

14   appear on companies' balance sheets.

15   Q.   And, Doctor Putnam, now, in this case CommScope, as we

16   see here, isn't accused of first infringement until November

17   of 2008. Does that change your analysis?

18   A.   Well, it could. Sometimes in a regular case you -- the

19   value of a technology changes over time and it makes a

20   difference when they begin to adopt the technology.

21   In this case, remember TQ Delta has an obligation not to

22   discriminate so it can't charge a different price depending on

23   when one of its licensees begins to infringe. So the price

24   you would have set when this standard was first approved is

25   the price you need to charge for a similarly-situated company

1   throughout the period.

2   Q.   Now, what would have happened if you had used 2008 as the

3   bargaining date?

4   A.   Well, remember I said that people -- Verizon discovered

5   that it was actually more expensive to install fiber than they

6   had originally thought, which meant that DSL was an even

7   better alternative to fiber in 2008.

8   And so if you wanted to exploit that fact, you could have

9   said to CommScope, oh, well, DSL is even more valuable to you

10 than we thought and so we're going to raise our rates. But

11 that would have violated the reasonable and non-discriminatory

12 promise, and so TQ Delta's not allowed to do that.

13   So by not choosing 2008, we're actually choosing a

14 smaller gain for DSL relative to fiber.

15 Q.   And, Doctor Putnam, who owned the patents in this case in

16 2008?

17 A.   Aware.

18 Q.   And does that change your analysis?

19 A.   No, because both Aware and TQ Delta had to make the same

20 RAND promise, and so you couldn't get a better deal from Aware

21 than you could get from TQ Delta for the same technology and

22 the rights to use the same patents in the same products.

23 Q.   And are the rates that TQ Delta offered to CommScope the

24 same rates it offered to other licensees?

25 A.   Yes.

1   Q.   Doctor Putnam, can you give us an example of these

2   studies that you looked at?

3   A.   Sure. I mentioned this one from Bear Stearns from 2005.

4   And so Bear Stearns estimated that over the course of the next

5   five years, that is, until 2010, and excluding the 4 million

6   homes that had already been upgraded, Verizon was going to

7   have to spend another $15 billion to install fiber. That's

8   just 60 percent of its households, which would be 17 million

9   homes.

10   So if you do the math for the 13 million additional

11   homes, that works out to about $1,154 of the cost to install

12   fiber in each home.

13   Q.   And, Doctor Putnam, you said you relied on other sources

14   than Bear Stearns?

15   A.   Yes. As I said, there were 22 sources overall for both

16   fiber to the premises--Verizon choice--and DSL.

17   Q.   And are those the types of sources that economists would

18   ordinarily rely on?

19   A.   Yes. I mean, I rely on them all the time. But the more

20   important point is that the investors actually relied on them

21   in making their investment decisions. So they weren't just

22   academic studies. This is what real people are choosing,

23   using, to decide whether to invest in the phone companies or

24   not.

25   Q.   And what did you learn from analyzing these studies about

1   the costs of fiber and DSL?

2   A.   Well, we -- it's easiest to sort of summarize them over

3   time. So let's start with fiber to the premises, which is --

4   we call it fiber. Each of the triangles in this graph, I've

5   plotted when the forecast was made and what the cost estimate

6   was per home.

7   THE COURT: Doctor Putnam, would you slow down a

8   little bit, please?

9   THE WITNESS: Oh. Yes, Your Honor. I'm sorry.

10   THE COURT: Thank you. It would be helpful if you'd

11   do that.

12   THE WITNESS: Yes. I'm sorry.

13   Each triangle on the graph is plotted based on the date

14   of the forecast, and you can see that it ranges somewhat. The

15   lowest estimate is around $700, the highest is about 1500.

16   And the average over all these studies is around $1,154 over

17   this time period.

18   Q.   (BY MR. FINK) And, Doctor Putnam, did you also look at

19   the DSL costs?

20   A.   Yes. So there are separate studies that have looked at

21   the costs of DSL for fiber to the node. Those costs are much

22   lower. They ranged from around $230 to about $750. They're

23   shown in the orange squares here. And the average across all

24   the studies is about $466, which means that the difference in

25   cost, the average difference in cost between the two, is about

1    $688 of savings per household.

2   Q.   And, Doctor Putnam, is this $688 figure the figure that

3   you used for the cost difference between DSL and fiber?

4   A.   No. I mean, I started there, but what you really want to

5   do is get down into the weeds a little bit and look at the

6   individual studies.

7   So some of them are forecasts. Some of them are actuals.

8   Some of them are made at one point in time. Some of them are

9   made at a different point in time. So you want to control for

10   these differences across the studies.

11   I used a technique called regression analysis, which is a

12   statistical tool that economists use to control for

13   differences. And so I came up with a smaller estimate of the

14   true difference between the studies.

15   Q.   And, Doctor Putnam, is this regression analysis something

16   that economists use all the time?

17   A.   All the time.

18   Q.   And what was the result of your regression analysis?

19   A.   The result is that the cost savings of DSL over fiber

20   averaged about $543.90 per household over this time period.

21   Q.   And, Doctor Putnam, is this the incremental value of the

22   savings of DSL to the node over fiber?

23   A.   Yes.

24   Q.   And so, Doctor Putnam, what did you do after you had this

25   $543.90 figure?

1   A.   Well, now we begin the process of -- now we know the gain

2   from the overall standard on a per-household basis. Now we

3   begin the process of trying to convert that gain to a gain per

4   device and per patent so that we can actually figure out TQ

5   Delta's royalties.

6   Q.   And what was the first step that you did there?

7   A.   Well, the first step is we've got a gain per household,

8   but we need to figure out a gain for each device that is sold,

9   because that's the infringing act or one of the infringing

10   acts in this case which is a sale of a device by CommScope.

11   So how many devices by household is the question.

12   Q.   And how did you calculate that change from per household

13   to per device?

14   A.   Well, at this time it was expected that each household

15   would use approximately two generations of DSL standards, and

16   each generation requires two devices, one at the house and one

17   back in the central office.

18   So there's a total of four DSL devices on average that

19   were expected to be used per household. So we have to divide

20   this gain by four to get a per device gain.

21   Q.   And what did that work out to be, Doctor Putnam?

22   A.   So if you do the math here, $543.90 divided by 4 is

23   $135.97 of gain per device, DSL device.

24   Q.   And what did you do next, Doctor Putnam?

25   A.   Okay. Well, that's the total gain from the standard, but

1   remember the standard is created not just for patent holders,

2   it's created for everybody. The ITU consists of patent

3   holders like TQ Delta and implementers or users like

4   CommScope. So all those people get together in the big, you

5   know, conference hall and create this standard so that

6   everybody wins.

7   So what I've pictured here is a hypothetical meeting of

8   those people where they decide, how are we going to divide up

9   the gains that our standard is going to create. And so on one

10   side you see the people who hold the patents, that actually

11   created the technology; and on the other side people who use

12   those patents, the implementors like CommScope who sell the

13   products.

14   Q.   And why was it important to divide up the gains between

15   these two parties?

16   A.   Well, because the goal of the organization, the ITU's

17   goal, is that both sides are treated fairly. The implementors

18   need to be charged a reasonable and non-discriminatory price.

19   You can't just jack up the price because they have to use your

20   patent. And the patent holders have to receive a fair price

21   for the technology that they created that allows the

22   implementors to sell the devices that they are going to sell.

23   Q.   And how did you divide up the cost savings between these

24   two groups?

25   A.   Well, economists study bargaining in a wide variety of

1   situations because it's very important how people bargain and

2   how they decide to trade or not too trade. So in an

3   organization like this, in a wide variety of circumstances, if

4   you tell people that when they're bargaining, they have to

5   bargain fairly, and then you ask them or you observe how they

6   bargain, what's the result of that, what they generally do is

7   they divide the gains evenly between them, they're equal,

8   because they're trying to be fair to each other. So that

9   occurs in a wide variety of commercial and experimental

10   situations.

11   And it's particularly true here because, although I've

12   drawn a table kind of artificially where the patent holders

13   are on one side and the implementors are on the other, in most

14   standard-setting organizations, the same company is on both

15   sides of the table. People who invent things also make

16   things.

17   And so while they would like to get a lot of money for

18   their patents, they don't want to pay a lot of money for

19   everybody else's patents. And so that causes them to choose a

20   set of terms that is going to be fair to both parties. So we

21   say that the bargaining positions are symmetric and

22   countervailing. And under those circumstances where

23   bargaining positions are symmetric and countervailing, people

24   divide the claims equally between them.

25   Q.   And what was the result of your division here?

1   A.   If you do the math again, now we have $135 of gains per

2   box, divided by two, the patent holders' share of those gains

3   is $67.99.

4   Q.   And so, Doctor Putnam, are you saying that TQ Delta and

5   CommScope would have bargained to divide the gains 50/50?

6   A.   No. This is not a bargain between CommScope and TQ

7   Delta. This is a bargain or it's really more of a policy

8   within the ITU. The ITU says both groups must be treated

9   fairly and so both groups share in the gains.

10   Q.   And what did you do next, Doctor Putnam?

11   A.   Well, now we have the value of all the patents, the gains

12   created by all the patents in the standard. So we have to

13   know how many patents there are in the standard.

14   Q.   And how did you calculate that?

15   A.   Well, this was a complex sampling process because the ITU

16   actually doesn't know which patents are essential to the

17   standard that it creates, so we have to make an estimate of

18   that.

19   So we started out with the names of every company that

20   made a disclosure to the ITU, and we looked at all of their

21   DSL patents, which turns out to be almost 15,000. So these

22   are what we call potentially essential patents. And we want

23   to identify those in that set that are actually essential.

24   Q.   And so did you go out and look at the ITU and see all the

25   companies that had provided declarations and then find out

1   what patents they had for DSL?

2   A.   Yes.

3   Q.   And then what did you do next?

4   A.   Well, it's -- it's -- you can imagine it's not possible

5   to read 15,000 patents, at least in anybody's lifetime. So we

6   needed to find some way to sample those patents to get a

7   reasonable estimate. A sample is like a poll. So if you want

8   to know who's going to win the presidential election, you

9   don't ask everybody in the country. You take a poll of a

10   couple of thousand people.

11   So we asked Doctor Cooklev to analyze a sample of the

12   patents, and we created that sample using statistical

13   principles so that it would be representative of the larger

14   population.

15   Q.   And how big of a sample did you give Doctor Cooklev to

16   review?

17   A.   We took a sample of 1,100 patents that Doctor Cooklev

18   actually read.

19   Q.   So you had Doctor Cooklev read 1100 patents for this

20   case?

21   A.   Yes. It took hundreds of hours. That's right.

22   Q.   Okay. And how did you determine how big of a sample you

23   needed to give Doctor Cooklev?

24   A.   Well, any time you're sampling statistically, there are

25   certain principles you have to follow. And so we followed

1   those accepted statistical principles to create a

2   representative sample. And, in particular, we used a

3   technique called oversampling.

4   Oversampling means that you look in certain parts of that

5   stack where you think the patents are especially likely to be

6   essential, and you don't look in parts of the stack where it

7   seems unlikely that the patents are going to be essential.

8   So we oversampled and gave -- we sampled from the entire

9   stack, but we sampled more intensively from the parts of it

10   that were more likely to have essential patents.

11   Q.   And did you work with Doctor Cooklev as part of this

12   process?

13   A.   Yes.

14   Q.   And did you have conversations with him as part of this

15   process?

16   A.   Yes.

17   Q.   And so yesterday in court CommScope's counsel asked

18   Doctor Cooklev if he was familiar with certain keywords that

19   are used to create the sample. Are you familiar with that

20   part of the process?

21   A.   Yes.

22   Q.   And were you surprised that Doctor Cooklev was not

23   familiar with some words like franking?

24   A.   No, not at all.

25   Q.   And why not?

1   A.   Well, Doctor Cooklev is a DSL patent expert. So we want

2   him reading patents that could be essential to the standard.

3   We don't want him reading patents that might mention DSL

4   somewhere in the patent but have nothing to do with the

5   essential technology at issue in this case.

6   So franking, for example, franking refers to the process

7   of putting a stamp on a letter. All right? It has nothing to

8   do with DSL standards. We didn't want Doctor Cooklev reading

9   a patent like that. So the fact that he was unfamiliar with

10 that technology simply meant that shows that we had gotten rid

11 of or made it less likely to sample patents that were

12 unrelated to the standard. He shouldn't be familiar with

13 technology that he's not familiar with. That's -- the system

14 worked.

15 Q.   And so when you used, I guess, these words that Doctor

16 Cooklev gave you, were they knocking out the whole word or was

17 it just part of the word or how did that work?

18 A.   Well, it knocks out the whole word. So, for example, one

19 of the words that came up was de. De is not a word in the

20 English language. So if it appears in a patent -- I don't

21 know why it would. But if it appears in a patent, it wouldn't

22 take out other words that might be related to this case like

23 deinterleaving. It would just take out de. So that

24 patent -- and it wouldn't take out that patent. That's

25 important to emphasize. It would just make it less likely

1   that that patent would be sampled.

2   So Doctor Cooklev, you know, is a smart guy and he's

3   trying to read the patents that are actually related to this

4   technology. It's unlikely that a patent that has the word

5   'de' in it is going to be essential to the DSL standard.

6   Q.   So to be clear, Doctor Putnam, none of these 14,848

7   patents were removed from your sampling consideration based on

8   any word in them?

9   A.   No, that's right.

10   Q.   And, Doctor Cooklev [sic], are you aware of any -- sorry,

11   excuse me. Doctor Putnam, are you aware of any evidence that

12   Doctor Cooklev failed to sample any patent that was actually

13   essential to DSL?

14   A.   No.

15   Q.   As part of that sampling review process?

16   A.   No. There is no evidence that he actually overlooked any

17   essential patent.

18   Q.   And so do you have any reason to believe that the sample

19   that you got back from him was biased?

20   A.   No.

21   Q.   And what did Doctor Cooklev find after he spent those

22   hundreds of hours reviewing 1100 different patents?

23   A.   He found that based on the DSL -- he compared the claims

24   of the patent to the standard and found that 33 of the patents

25   that he analyzed were actually essential to one or more DSL

1   standards.

2   Q.   And so is this then 71 number what you used to divide

3   that gain that we calculated earlier?

4   A.   Yes.   So you remember that I said that we oversampled the

5   15,000 patents to look in the places where they are

6   particularly likely to be found.

7   What you do then from the sample is extrapolate back up

8   to the population.   So if we found 33 in the stack of 1100,

9   how many would we expect to find in the stack of 18,000?   The

10   answer is 71.   And so we just reversed the sampling process to

11   extrapolate to the larger population.

12   Q.   And so did you use this 71 number to then divide that

13   gain that we saw earlier?

14   A.   Well, we would.   We're almost there.   But Doctor Cooklev

15   also analyzed which DSL standards the 71 patents were

16   essential to and how many DSL standards.   So we really care

17   about is how many times is each one of these 71 families

18   essential to at least one standard.

19   And so we have to do that math, which is on the next

20   slide, I believe.   So there's 71 families.   On average, these

21   are essential to 2.9 DSL standards.   So that means there's a

22   total of 205 times that a patent family is essential to at

23   least one DSL standard.

24   Q.   And what did you do with this 205 number then?

25   A.   Okay.   So now we finally got to the number we care about,

1   we have the -- the pie for patentees which is $67.99. We have

2   to divide that pie into 205 pieces. So every time you have a

3   patent that's essential to a DSL standard, you get a slice of

4   that pie.

5   So the question is, what's the value of that pie? And

6   when you divide $67.99 by 205, you get 33 cents per patent

7   family per DSL standard.

8   Q.   And how many of those, I guess, 33-cent pie pieces did

9   you find TQ Delta was entitled to?

10   A.   Well, that's where we have to go back to the expert

11   reports and look at each one of the individual patents and see

12   what TQ Delta claims is for each one of the patents and which

13   standards they are essential to.

14   Q.   And is that what you're showing here in this chart?

15   A.   Yes. So what we want to do here is, what I've done is

16   list each one of the patents at issue in this case along with

17   the name -- the shorthand name for it like the truck roll

18   patent, for example.

19   So the truck roll patent, also called the '686 Patent is

20   essential to VDSL2. And so we assign a royalty for the

21   infringement of that patent of 33 cents. And then we do the

22   same thing for all the other patents and for all the other

23   standards and then total that up.

24   Q.   And, Doctor Putnam, I see down here on the lower left you

25   have two of the patents labeled non-essential. What is that

1 referring to?

2 A.   So remember I said at the beginning that only five of the

3 seven patents asserted in this case are essential and subject

4 to a RAND promise. These two down here are not.

5 Q.   And did you also separately analyze those patents?

6 A.   Yes. Because they're not essential, then you can analyze

7 them in the traditional fashion and ask, well, what's the gain

8 provided by these two patents because there's an alternative

9 to them, at least in theory. So that's what we did.

10 Q.   And does TQ Delta have a RAND obligation with respect to

11 those two patents?

12 A.   No.

13 Q.   And so how did you value those two patents?

14 A.   Well, we heard from Doctor Heller that the important

15 benefit from these patents is to reduce the size of the chip

16 that's being manufactured. The smaller the chip, the more the

17 cost savings. The average cost savings, given the price of

18 the chip, is about 71 cents per unit. So that's the gain

19 created by these patents. And we could have used 71 cents as

20 the measure of the gains they created.

21 Q.   And so, Doctor Putnam --

22   THE COURT: Just a minute. We've got a gentleman in

23 the gallery that's using a cell phone to take pictures of the

24 of demonstratives.

25   UNIDENTIFIED SPEAKER: I'm trying to magnify. I

1   can't see the details.

2   THE COURT: I don't want you taking pictures of the

3   demonstratives.

4   UNIDENTIFIED SPEAKER: Absolutely not.

5   THE COURT: These monitors are to visualize from,

6   not to copy or reproduce.

7   UNIDENTIFIED SPEAKER: No.

8   THE COURT: All right. Let's continue.

9   Q.   (BY MR. FINK) Doctor Putnam, I see for these

10   non-essential patents here you have 33 cents instead of 71

11   cents. Why is that?

12   A.   Well, in general, remember these patents in the real

13   world, all these patents are a part of the TQ Delta's patent

14   portfolio. They're all licensed together. It's generally not

15   common to price individual patents separately within a

16   portfolio.

17   And since most of them are in -- most of the patents in

18   the portfolio are subject to a RAND commitment, we felt that

19   the more reasonable and conservative thing to do would be to

20   say, let's charge the same royalty rate for the non-essential

21   patents for the -- as for the essential patents even though

22   the royalty rate in principle could be higher. But in a

23   commercial setting, the reasonable thing to do would be to

24   charge the same royalty rate for them.

25   Q.   So you determined that they were worth 71 cents apiece,

1   but you're only charging 33 cents in a sense to be fair. Is

2   that right?

3   A.   Yes. And consistent with commercial practices.

4   Q.   And so, Doctor Putnam, I see here that the patents are

5   then all valued at essentially 33 cents on average. Is that

6   right?

7   A.   That is -- 33 cents is the average value for each DSL

8   patent family as we explained earlier, yes.

9   Q.   And what if TQ Delta's patents are below average in

10   value?

11   A.   Well, that's a good question. I investigated that. So I

12   wanted to see whether it was possible that TQ Delta's patents

13   didn't deserve an average royalty rate. So I took the sample

14   of essential patents that Doctor Cooklev created, the 33, and

15   ranked TQ Delta's patents within that sample using a method

16   called citation analysis.

17   Q.   And what is citation analysis, Doctor Putnam?

18   A.   Well, when you have to value -- so citation analysis is

19   when a -- just very briefly, when a patent is examined, the

20   patent examiner looks at the prior art. Most of the prior art

21   consists of earlier patents because the examiner is trying to

22   decide whether to issue a new patent.

23   When he finds a patent that's relevant to his decision or

24   her decision, then he's -- it's called a citation or a

25   reference, and the earlier patent is then cited. The more

1   times a patent is cited in later examinations on average, the

2   more valuable it is. There's been thousands of economic

3   studies on this issue.

4   So when you're trying to value a large number of patents

5   as we are here, you count the number of citations, adjusted

6   for age, and ask yourself which are the most valuable, which

7   are the most highly cited. The TQ Delta patents all ranked in

8   the top 50 percent of those 33.

9   Q.   And so what did you conclude from your analysis?

10   A.   Well, the top 50 percent are worth about twice the

11   average. So by assigning the -- only the average value to the

12   TQ Delta patents, we've actually undervalued them and so we've

13   been conservative in that estimation.

14   Q.   And, Doctor Putnam, I see here for G.bond, it says 66

15   cents. Why is that?

16   A.   Well, G.bond, remember, bonds together two lines. And so

17   there are two uses of the technology, two devices, and so you

18   double the royalty rate to reflect that double use.

19   Q.   And so, Doctor Putnam, ultimately are you finding here

20   that if all of the patents are infringed, CommScope's per unit

21   damages are $2.99?

22   A.   Yes. So when you add this up across all the standards,

23   the three standards at issue in this case, and all the

24   patents, a device that practiced all of the patents would owe

25   a royalty of $2.99.

1   Q.   And did you then calculate, I guess, this $2.99 rate

2   across all of the units that were sold in this case?

3   A.   Yes.   So we're nearing the end.   Now we have to figure

4   out for all the units what's the royalty owed.

5   Q.   And so, I guess, what did you do next then?

6   A.   Well, you can see in very small print a copy of one of

7   the tables that I produced, and this has all of CommScope's

8   products, all of the sales of those products in all of the

9   years that are relevant to this case by unit.

10   And so you can see an extract of that.   So, for example,

11   in the upper right, the BGW210 which I think we've heard a

12   little bit about, those are the annual sales of that product

13   through 2022 for a total of about 12.2 million units sold.

14   Q.   And so then what did you do with the per year totals of

15   unit sales?

16   A.   Well, so in the second panel, we see that for the BGW210,

17   we count the number of times -- number of patents that that

18   product is accused of infringing for each standard--five for

19   VDSL2, two for G.INP, one for G.bond, a total of eight.   We

20   double the G.bond one because of the two uses.   That's a total

21   of $2.99 per unit sold.

22   And so then we have to multiply those -- the number of

23   units times the royalty per unit, and that's what we get in

24   the third panel.   So total royalties due are about $36.6

25   million for sales of that product.

1   Q.   And did you find that every CommScope product infringed

2   the same number of patents?

3   A.   No, because they don't all practice the same standards.

4   So if the product didn't practice G.bond, then you would earn

5   a lower royalty. And so we went through product by product to

6   make sure that we took account of that.

7   Q.   And so you did those adjustments on a per product basis

8   in your analysis?

9   A.   Yes.

10   Q.   And, Doctor Putnam, overall, what years did you calculate

11   damages for?

12   A.   Well, the years that we used are 2015 through 2022.

13   Q.   And did you make adjustments for those years for the

14   patent lifetimes?

15   A.   Yes. I think it's important to explain -- yes, I did.

16   Q.   And, Doctor Putnam, is there something that's important

17   to explain about the ranges of years that you calculated?

18   A.   Well, only that the question is why 2015. And so the

19   answer is, I've been instructed that TQ Delta can obtain

20   damages for up to six years prior to the date that it filed

21   suit in this case. It filed suit in -- August of 2021, which

22   means it can collect damages for infringing acts that occurred

23   back to August of 2015.

24   So we go back to August of 2015, and then forward to

25   2022, which is the last time that CommScope produced sales

1   data.

2   Q.   And did you also calculate damages for a second group?

3   A.   Yes.   So there's a separate theory of infringement which

4   I think CommScope's technical witnesses have talked about, and

5   that is this: If a device was sold before 2015, then the sale

6   of that device is not an infringing act.   But if it's used

7   after 2015 and that use is supported by CommScope, and the

8   Judge will instruct you on exactly what that means, it's

9   called induced infringement, if there's been technical

10 support, warranty service, and that sort of thing for devices

11 used after 2015, then according to TQ Delta, CommScope is

12 liable for those uses also.

13   So we took into account five years of sales prior to 2015

14 for devices that would have been used after 2015 and then

15 therefore fall into the damages period.

16 Q.   And, Doctor Putnam, I see here on your slide that some of

17 these patents appear to expire before the end of 2022.   Is

18 that correct?

19 A.   Yes.   This chart shows the lifetimes of the patents at

20 issue in this case, and you're correct that certain of those

21 patents expired before 2022.

22 Q.   And how did you use those patent lifetimes in your

23 calculation?

24 A.   Well, the principle, of course, is that if a patent is

25 not alive, you can't collect a royalty for it.   If it is

1   alive, you can collect a royalty for it. So once the patent

2   expired, then we removed the royalty from a device that

3   practiced that patent but the patent is no longer alive.

4   Q.   And so did you then, as part of your calculation, adjust

5   for the fact that a patent was alive or was not alive in a

6   given period of time?

7   A.   Yes. So if a device was -- practiced all eight patents

8   and it was sold in 2021, then the royalty would have been

9     $2.99. But it would have been lower if it was sold in 2022

10   because by then some of the patents had expired.

11   Q.   And, Doctor Putnam, what did you find ultimately after

12   you tallied all of these numbers up?

13   A.   Well, when all is said and done, in the period from

14   August 2015 to 2022, CommScope sold 23,364,354 units. And

15   with the adjustments for the different standards and the

16   different patent lifetimes, the royalties on those units are

17    $66,816,234.

18   Q.   And what did you find for your calculation of that other

19   time period?

20   A.   Well, going back five years which, by the way, is the

21   expected lifetime of a CommScope accused product, the units

22   sold are 12,715,222 units, and the royalties on those units

23   are $22,243,806.

24   Q.   And what did that total out to?

25   A.   So, in total, the number of infringing units is

1   36,079,576 and the total royalties are $89,060,041.

2   Q.   And, Doctor Putnam, did you consider non-infringing

3   alternatives?

4   A.   Yes, I did.

5   Q.   And what is a non-infringing alternative?

6   A.   Well, in a typical patent case, one of the arguments that

7   the parties would consider is whether the defendant had the

8   chance to use some other technology or accomplish the same

9   objective by using some method that didn't infringe the

10   plaintiff's patents.

11   Here, that doesn't apply because the only alternative

12   that's available to CommScope is to either practice the

13   standard as a whole or not practice it at all. You can't swap

14   out technologies just because you infringe some of the patents

15   in the standard.

16   And in any event, CommScope's experts haven't identified

17   any non-infringing alternative. So I considered the prospect

18   of them, but they don't apply in this case.

19   Q.   And were any alternatives identified for the

20   non-essential patents as well?

21   A.   Well, yes. But the alternatives, as I said, were more

22   expensive because they involved creating a larger chip. And

23   so we measured the cost savings over those alternatives.

24   Q.   And, Doctor Putnam, did you consider any patent licenses

25   as part of your analysis?

1   A.   Yes. Well, that's some of the most important evidence in

2   this case because what you want to do is see how these

3   calculations compare with what people do in the real world.

4   And so the next thing to do is to go look at those real world

5   agreements and see how they compare.

6   Q.   And what licenses did you consider?

7   A.   Well, I looked at all of them, but I think it's simplest

8   and most instructive to look at the Nokia license

9   because -- for two reasons. One is it's the largest TQ Delta

10   license, so it's most comparable to CommScope in that sense.

11   And it's the most recent TQ Delta license because it was only

12   executed a few months ago in November of 2022.

13   Q.   And so, Doctor Putnam, did you consider -- what were the

14   overall licenses that you considered?

15   A.   Well, there's the Nokia license. And then, of course,

16   there's the Zhone and ZyXEL licenses and the Fujitsu and

17   Siemens licenses.

18   Q.   And did you consider licenses from just TQ Delta or did

19   you consider them from other parties?

20   A.   No. I mean, we also looked at licenses for Aware and

21   CommScope itself.

22   Q.   And can you briefly summarize what you found in the Nokia

23   license?

24   A.   Yes. So we talked about the conditions of the license

25   and how important it is to have both reasonable terms and

1   reasonable conditions, so we need to know what the conditions

2   are. So just briefly, the region of the license is the U.S.

3   only. It's not worldwide.

4   MR. DACUS: I hate to interrupt, but I do think we

5   probably need the courtroom sealed for this information.

6   THE COURT: Mr. Fink?

7   MR. FINK: No objection.

8   THE COURT: All right. Out of an abundance of

9   caution, to protect confidential information, I'll order the

10 courtroom sealed at this juncture.

11   I'll direct that all persons present who are not subject

12 to the protective order that's been entered in this case

13 should excuse themselves and remain outside the courtroom

14 until it's reopened and unsealed.

15   (Courtroom sealed.)

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25   (Courtroom unsealed.)

1   THE COURT: All right. The courtroom is open and

2   unsealed. The binders have been distributed. Let's proceed

3   are with cross-examination.

4   MR. DACUS: Thank you, Your Honor.

5   CROSS EXAMINATION

6   BY MR. DACUS:

7   Q.   Good morning, Doctor Putnam.

8   A.   Good morning.

9   Q.   I'm Deron Dacus, and I represent CommScope and it's good

10   to meet you, sir.

11   A.   Likewise.

12   Q.   I'd like to ask you a few questions about some of your

13   opinions in this case if that's all right?

14   A.   Sure.

15   Q.   You were here when the Judge read his preliminary jury

16   instructions to the jury? Correct?

17   A.   Yes, I was.

18   Q.   And you heard him say that for all the witnesses, one

19   thing they need to do is assess the credibility of each

20   witness. You heard him say that?

21   A.   Yes.

22   Q.   And you heard him say, particularly with respect to

23   experts we need to look at and the jury needs to look at the

24   experience of the particular expert in the area that they're

25   testifying about. You agree?

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1    A.   Yes.

2    Q.   And just so we have this out of the way, I heard you say

3    that you got paid for the work that you've done in this case.

4    Correct?

5    A.   Yes.

6    Q.   You got paid on an hourly basis.  Is that right?

7    A.   I did.

8    Q.   What's your hourly rate?

9    A.   At the present time it's $740 an hour.

10   Q.   Okay.  So you're here as an expert testifying as to what

11   parties would have negotiated as a royalty for a patent

12   license related to DSL technology.  Correct?

13   A.   No.

14   Q.   You're not attempting to give the jury any opinions about

15   what these parties would have negotiated in a hypothetical

16   negotiation related to patents related to DSL technology?

17   A.   Hypothetical negotiation is one way of looking at it, but

18   I measured the gains that -- from TQ Delta's patents.

19   Q.   Aren't you supposed to be looking at the hypothetical

20   negotiation between the owner of the patent at the time,

21   Aware, and CommScope/2Wire?  Do you understand that's what

22   you're supposed to be doing or is that not what you did?

23   A.   Well, I did look at a hypothetical negotiation, that's

24   true, but a hypothetical negotiation is only one tool and it's

25   an optional tool for examining a reasonable royalty.
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1   Q.   So just so we're clear here, you did not conduct a

2   hypothetical negotiation as part of your analysis in this

3   case. That's a true statement. Correct?

4   A.   No, that's not true. It's disclosed in my expert report.

5   Q.   So did you perform a hypothetical negotiation or did you

6   not?

7   A.   I did do that as part of the analysis. I didn't present

8   that analysis today.

9   Q.   Okay. So you agree that what we're trying to do here is

10   figure out what these folks would have negotiated back in 2008

11   as a royalty on the patents. Correct?

12   A.   No.

13   Q.   So you didn't do that?

14   A.   I did do that. That's not what I presented today.

15   Q.   So you haven't told the jury anything about this

16   hypothetical negotiation that I guess you did but you didn't

17   tell the jury about it. Is that a fair statement?

18   A.   That's true.

19   Q.   You agree, sir, that in your career you have never

20   negotiated a patent license for DSL technology. Correct?

21   A.   That's true.

22   Q.   Indeed, you've never negotiated a patent license of any

23   kind. True?

24   A.   I am economist. That's right.

25   Q.   And before your work for TQ Delta, sir, you've never

1   valued DSL technology. Correct?

2   A.   Yes.

3   Q.   My statement is correct?

4   A.   It is.

5   Q.   Although you don't have experience in negotiating patent

6   licenses for DSL technology, what you do have experience in

7   and what you've earned a reputation for is asking for very

8   high royalties in cases where patent owners have a RAND or a

9   FRAND commitment. Correct?

10   A.   No.

11   Q.   You know in this lawsuit one thing you have to do is you

12   have to provide an expert -- a written expert report.

13   Correct?

14   A.   Yes.

15   Q.   And what this Court requires is that you also provide a

16   resume. Correct?

17   A.   Yes.

18   Q.   And you've done that in this case. Correct?

19   A.   Of course.

20   Q.   And so on your resume, you actually identify whether or

21   not the cases that you were involved in as an expert were a

22   FRAND case or a RAND case. Correct?

23   A.   That is true.

24   Q.   You also identify whether or not the case was pending or

25   filed in a district court. Correct?

1   A.   Yes.

2   Q.   And so it's true, sir, that you represented or you were

3   the expert for a company called Interdigital in a case against

4   Lenovo and Motorola. Correct?

5   A.   Yes.

6   Q.   You represented the patent owner. Correct?

7   A.   Yes.

8   Q.   That was a FRAND case. Correct?

9   A.   Yes.

10   Q.   And you asked for a royalty on behalf of the patent

11   owner. Correct?

12   A.   There are several Lenovo cases, so I'm not sure which one

13   you're referring to. But, yes.

14   Q.   Well, I was going to get to that. Actually, as you said,

15   you were involved in several cases on behalf of Interdigital,

16   the patent owner, suing Motorola, Lenovo, another company

17   called OPPO. Correct?

18   A.   Yes.

19   Q.   You also represented Interdigital against the company

20   called Zhou Mei. Correct?

21   A.   Yes.

22   Q.   You -- also in another district court case, you were the

23   expert for Ericsson. Correct?

24   A.   That's right.

25   Q.   Ericsson's the patent owner or patent holder. Correct?

1   A.   That's right.

2   Q.   That was a FRAND or a RAND case. Correct?

3   A.   Yes.

4   Q.   That's where Ericsson's doing the suing. Correct?

5   A.   Yes.

6   Q.   You were also an expert on behalf of a company called

7   Evolved Wireless. Correct?

8   A.   That's right.

9   Q.   You represented the patent owner. Correct?

10   A.   Yes.

11   Q.   That was a case that involved FRAND or RAND. Correct?

12   A.   Yes.

13   Q.   Evolved is the one doing the suing and asking for the

14   money. Correct?

15   A.   That's right.

16   Q.   And by my count in your resume, there were six of those

17   cases that evolved wireless hired you on. Is that right?

18   A.   That's right.

19   Q.   And then Ericsson hired you again in a case against

20   Mercury Electronics and Micromax. Correct?

21   A.   Yes.

22   Q.   You represented the patent owner again. Correct?

23   A.   Yes.

24   Q.   In a FRAND case. Right?

25   A.   That's right.

1   Q.   You represented the people doing -- the company doing the

2   suing and asking for money. Correct?

3   A.   That's right.

4   Q.   So in every one of those cases, you represented the

5   people who were doing the suing and asking for the money even

6   with a RAND or a FRAND obligation. Correct?

7   A.   No.

8   Q.   The ones that we just went through, you represented the

9   patent owner in each one of those. Correct?

10   A.   The ones we went through, yes.

11   Q.   Now, you're not here to talk about the infringement of

12   these patents. Correct?

13   A.   No, of course not.

14   Q.   You're not here to talk about whether or not the patents

15   are valid. Fair?

16   A.   That's right.

17   Q.   And your calculation, I think you said you assumed that

18   all of the patents are valid and you assumed that they're all

19   infringed. Correct?

20   A.   That's right.

21   Q.   Now, you understand that's ultimately the jury's

22   decision. Right?

23   A.   Of course.

24   Q.   And to the extent the jury finds that a patent is not

25   infringed, then there are no damages. You understand that?

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 1    A.    Yes.

 2    Q.    To the extent the jury finds that any particular patent

 3    is invalid, then there's no damages.  Do you agree?

 4    A.    Yes.

 5    Q.    So if they find either not infringed or invalid, then

 6    there are no damages.  Correct?

 7    A.    That's true.

 8    Q.    And with all due respect to you, they can just ignore

 9    your testimony if they find that.  Fair?

10    A.    Of course.

11    Q.    But you don't know how the jury's going to find, I don't

12    know how the jury's going to find, so it's my obligation to

13    make sure that they have all the evidence related to damages

14    and that's why I need to ask you some questions.  Does that

15    sound fair?

16    A.    Sure.

17    Q.    Now, I know you didn't present to the jury your

18    hypothetical negotiation, but I want to ask you about in 2008

19    when this license agreement would have been negotiated a

20    little bit of information about the two parties.  Okay?

21    A.    Okay.

22    Q.    So one side would sit 2Wire and CommScope.  Right?

23    A.    Yes.

24    Q.    And you know that CommScope has a 40-year history of

25    innovation.  Correct?
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1   A.   Yes.

2   Q.   You know that they have 40-year history of innovation in

3   communications networks infrastructure.   True?

4   A.   Yes.

5   Q.   You know that and you heard from the stand yesterday from

6   Mr. Wauters they have significant research and development at

7   the company.   Correct?

8   A.   Yes.

9   Q.   They spend tens of millions of dollars on that research?

10   A.   Yes.

11   Q.   They have over 15,000 patents.

12   A.   That's what he said, yes.

13   Q.   Well, you know that from your work in this case.

14   Correct?

15   A.   I haven't looked at CommScope's patents that are not

16   related to DSL, but I take his word for it.

17   Q.   You know, sir, from your report that CommScope has

18   licensed many of its patents to other companies.   Correct?

19   A.   Yes.

20   Q.   You also know that they've paid for licenses to other

21   companies who have patents.   Correct?

22   A.   Yes.

23   Q.   So just to sort of set the stage here, CommScope is a

24   company that has patents, has licensed those patents to

25   others, has paid others in the industry when they have

1   patents. All of that's true. Correct?

2   A.   Yes.

3   Q.   So from CommScope's perspective, and I'm assuming you

4   would agree, they know what a valid claim of patent

5   infringement looks like, they know what a valid claim to a

6   license looks like for a reasonable amount of money. Correct?

7   A.   Not necessarily.

8   Q.   Okay. You also know and you've heard that they've

9   participated in the ITU standard-setting organization.

10   Correct?

11   A.   Yes.

12   Q.   So they're aware and familiar with the RAND and FRAND

13   obligation in that organization. Fair?

14   A.   I assume so.

15   Q.   Now, in 2008 at the time of this negotiation, the owner

16   of the patent would have been Aware, not TQ Delta. Correct?

17   A.   That's what I said, yes.

18   Q.   Okay. And we don't have to guess at how Aware would have

19   licensed these patents in 2008 because we know they were

20   actually licensing the patents in 2008. Correct?

21   A.   I disagree.

22   Q.   Are you -- do you know that Aware entered into licenses

23   in and around that 2008 time period?

24   A.   For semiconductor chips, yes, not for DSL equipment.

25   THE COURT: Doctor Putnam, pull the microphone just

1   a little closer, please.

2   THE WITNESS: Yes, Your Honor. Thank you.

3   THE COURT: Thank you.

4   Q.   (BY MR. DACUS) Just so we're clear, Aware entered into

5   licenses for the patents that we're talking about in this

6   lawsuit plus many more in or around the 2008 time period.

7   True?

8   A.   True.

9   Q.   And we know that Aware had a RAND obligation or a RAND

10   promise related to those licenses. Correct?

11   A.   Yes.

12   Q.   Now, I'd like to ask you some questions about generally

13   how you should go about and how the jury should go about

14   valuing a patent and a patent license. Is that fair?

15   A.   Sure.

16   Q.   You agree that the value of a patent varies from patent

17   to patent.

18   A.   In the abstract, yes.

19   Q.   Not in the abstract. In the real world, the value of a

20   patent varies from patent to patent. Correct?

21   A.   Not necessarily.

22   Q.   Did you submit a report in this case, sir?

23   A.   Yes.

24   Q.   Okay. And you have that report in front of you. If

25   you'd turn to tab 1. You can turn to page 190 of your report,

1   paragraph 376. You can let me know when you're there.

2   A.   Yes.

3   Q.   Okay. And just so we're clear, the rules of this Court,

4   Doctor Putnam, require that you write out a written report.

5   Correct?

6   A.   Yes.

7   Q.   And you review that report, and then you sign that report

8   to ensure that it's truthful and accurate. Correct?

9   A.   That's right.

10   Q.   And you did that in this case. Right?

11   A.   Yes, I did.

12   Q.   And so you agree, sir, that the value of patents varies

13   from patent to patent. Correct?

14   A.   Well, the sentence says in general and that sentence is

15   true, yes.

16   Q.   In general, the value of patents varies from patent to

17   patent. Correct?

18   A.   As I said, in general, not necessarily.

19   Q.   Some patents have lots of value and some patents have

20   zero value. Correct?

21   A.   That's frequently true, yes.

22   Q.   So just so we're clear here, just because a patent is

23   issued does not mean it has any monetary value. Correct?

24   A.   That's true.

25   Q.   And you know that's particularly true or at least can be

1   true in the setting of a standard and essential patent.

2   Correct?

3   A.   No, I disagree.

4   Q.   Okay. You understand, sir, that certain things are

5   included in standards that the ultimate implementer or user

6   does not necessarily use. Do you understand that?

7   A.   I guess I would say, no, that's not my understanding in

8   general.

9   Q.   Okay. Have you been in the courtroom during this trial?

10   A.   Parts of it, yes.

11   Q.   Okay. One of the things that TQ Delta points to is this

12   feature called ROC, R-O-C, as allegedly infringing a patent.

13   Do you understand that?

14   A.   Yes.

15   Q.   Were you here for the testimony where it was clear that

16   the ROC feature is turned off in the CommScope products?

17   A.   Well, I wasn't here, but remember for my purposes, I'm

18   assuming infringement. So I don't have an opinion about that.

19   Q.   Well, you do know, sir, that to determine the value of a

20   patent, we need to look at the use of the patent. Correct?

21   A.   Not necessarily.

22   Q.   Were you here for the opening statements?

23   A.   Yes.

24   Q.   Did you hear the TQ Delta lawyer say that to determine

25   the value of a patent, we need to look at the use that's made

1   of that patent?

2   A.   I heard what he said. I'm not sure that characterizes

3   that statement accurately.

4   MR. DACUS: Ms. Brunson, may I have the --

5   Q.   (BY MR. DACUS) So you know, sir, that we get a daily

6   transcript of the trial record. Right?

7   THE COURT: Pull that down a minute and come to the

8   bench, please. Opposing counsel, join us up here.

9   (The following was had outside the hearing of the

10   jury.)

11   THE COURT: Here's the problem I have with what you

12   just did, Mr. Dacus. I tell the jury they don't get a daily

13   transcript and they don't get to review the testimony in

14   writing and they have to remember everything and that's why

15   they get a notebook and can make notes. And now they know all

16   the lawyers get what they can't have.

17   And I do not want to create hard feelings between the

18   jury and trial counsel and the Court in light of what I've

19   told them and when you put the daily transcript on the elmo

20   and tell a witness, We get it every day.

21   MR. DACUS: I shouldn't do that. I won't do that.

22   THE COURT: And we've just told the jury we have

23   something you don't get and I'm not going to give it to you.

24   MR. DACUS: I'll just ask him about it without

25   reference to -- but I can show the transcript. Right? I

1   mean, they've done that.

2   THE COURT: I told this jury that the transcript is

3   prepared so that if there's an appeal to a higher court, it

4   can be used, but it's not available for them to consider in

5   their deliberations.

6   MR. DACUS: Understood.

7   THE COURT: And they now know that they're going to

8   have to operate under those rules and everybody else doesn't.

9   I'm worried that can be a problem, but I don't know how we fix

10   it at this point because the cat's out of the bag.

11   MR. DACUS: Yeah. I don't, either. I mean, I guess

12   my experience has been that we use trial transcripts. I

13   should not have said we have it, but -- but I do want to use

14   what was said in opening.

15   THE COURT: I'd prefer you quote it rather than show

16   it to them. Okay?

17   MR. DACUS: That would be fair.

18   THE COURT: All right. Let's proceed.

19   (The following was had in the presence and hearing

20   of the jury.)

21   THE COURT: Let's proceed, please.

22   MR. DACUS: Thank you, Your Honor.

23   Q.   (BY MR. DACUS) So to the extent that TQ Delta's lawyer

24   said in opening, I want to tell you real quickly, damages law

25   looks to what a reasonable royalty, it says in no event less

1   than a reasonable royalty, for the use made of the invention

2   by the infringer.

3   Do you agree with that statement, sir?

4   A.   That's what the law says, yes.

5   Q.   And then he said, So where do you look to understand

6   damages? You look to the amount of the use, you look to the

7   Defendants' use.

8   Do you agree with that statement?

9   A.   Yes.

10   Q.   So in this case you heard the testimony that with respect

11   to this R-O-C or ROC feature that TQ Delta claims infringes a

12   patent, that's turned off in the CommScope product. Do you

13   understand that?

14   A.   I do.

15   Q.   So the use is zero. Correct?

16   A.   Well, it's still an infringement. For my purposes,

17   that's the point.

18   Q.   The point -- actually your point, sir, is supposed to be

19   to value it. Those other technical guys are talking about

20   infringement. Correct?

21   A.   Yes.

22   Q.   You're supposed to value the infringement. Correct?

23   A.   Of course.

24   Q.   And what your lawyer said in opening and what you just

25   said is, to value it, you need to look to the amount of use.

1   Correct?

2   A.   Of course.

3   Q.   And for the R-O-C feature, there is zero use. That is a

4   true statement.

5   A.   But it's the sale that infringes, Mr. Dacus.

6   Q.   My statement that there is zero use is a true statement.

7   Correct?

8   A.   I have no opinion.

9   Q.   Okay. Have you been in the courtroom where we talked

10   about this dynamic D feature?

11   A.   No.

12   Q.   You at least, I assume, know about that feature.

13   Correct?

14   A.   Sure.

15   Q.   That's one of the features that TQ Delta claims infringes

16   one of its patents. Correct?

17   A.   Yes.

18   Q.   That's the '835 Patent. Do you know that?

19   A.   That's my understanding.

20   Q.   Were you in the courtroom when Mr. Wauters testified that

21   AT&T has no use for dynamic D and, therefore, CommScope

22   doesn't include it? There's no use of it.

23   A.   I heard Mr. Wauters' testimony obviously. I don't

24   understand any of the issues.

25   Q.   Do you understand that the dynamic D feature that's

1   accused of infringement and for which you make -- makes up

2   part of your 89 million, AT&T does not use it. Do you

3   understand that?

4   A.   I understand that they infringe.

5   MR. DACUS: Object to non-responsive, Your Honor.

6   THE COURT: It's partially responsive, but it's not

7   completely responsive. Ask the question again, please.

8   MR. DACUS: Be happy to, Your Honor.

9   Q.   (BY MR. DACUS) Do you understand, sir, that for this

10   dynamic D feature, one of the features you're supposed to be

11   valuing, the unequivocal testimony in this courtroom is that

12   AT&T does not use it and, therefore, we don't include it in

13   our products; there is no use. Do you understand that?

14   A.   Well, the point I was trying to make, Mr. Dacus, is I

15   don't understand that because I'm not a technical expert. I

16   have been instructed that the act of infringement is making or

17   using or selling, and so I'm operating under the assumption

18   that there is infringement of the patent regardless of the

19   technical nature of the use, which is not my bailiwick.

20   Q.   I'm not asking about the technical nature. You are the

21   money man. Correct?

22   A.   If you say so.

23   Q.   Well, that's what you just told the jury--that you're the

24   economist and that you want 89--plus another 7,

25   apparently--million dollars. Correct?

1   A.   No.

2   Q.   So you're here to value things in monetary and money

3   terms. Correct?

4   A.   That's true.

5   Q.   And we know from you and TQ Delta's lawyer that that

6   depends on the amount of use. Correct?

7   A.   As that word is defined in the law, of course.

8   Q.   So all I'm trying to determine is the amount of use.

9   Does that sound fair?

10   THE COURT: Does it sound fair to you that he's

11   trying to determine the amount of use? That's the question,

12   Doctor Putnam.

13   THE WITNESS: Yes. I'm trying to decide whether it

14   sounds fair because I think that's a question ultimately for

15   the jury.

16   Q.   (BY MR. DACUS) Yes, sir, it is. All these questions are

17   for the jury. And you understand, sir, my role is to try to

18   draw out the evidence from you as best I can so that they have

19   clear facts on which to make a decision. Does that sound

20   fair?

21   A.   Yes.

22   Q.   Loop diagnostic test. Have you heard of that before?

23   A.   I think so.

24   Q.   Sir, loop diagnostic test is one of the features that

25   TQ Delta claims infringes this patent. Do you understand

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1    that?

2    A.    I do.

3    Q.    That's one of the things you're supposed to value.  Do

4    you understand?

5    A.    I'm valuing the infringement of a patent.

6    Q.    Sir, if I asked you to go value my vehicle that sits out

7    there in that parking lot, would you want to know what kind of

8    vehicle I had?

9    A.    Of course.

10   Q.    Would you want to know how old it is?

11   A.    Yes.

12   Q.    How many miles on it?

13   A.    Yes.

14   Q.    So you're here to value loop diagnostic test, and your

15   testimony to the jury is you think you've heard of that

16   before.  Is that correct?

17   A.    I have heard of it.  My point is that it's a technical

18   term and I'm not a technical person.

19   Q.    Do you know, sir, based on the testimony that's occurred

20   in this courtroom, that AT&T, the user of the loop diagnostic

21   test, just doesn't have any use for it?  Have you heard that?

22   A.    My assumption is they're infringing, Mr. Dacus.

23              MR. DACUS:  Object as non-responsive, Your Honor.

24              THE COURT:  Sustained.

25   Q.    (BY MR. DACUS)  You agree with me, sir, that at least
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1   based on the testimony in this lawsuit so far that the loop

2   diagnostic test for which you seek $89 million in total is not

3   used by CommScope's customer AT&T. That is a true statement.

4   Correct?

5   A.   I don't have an opinion.

6   Q.   That is one of the features you are supposed to be

7   valuing. Correct?

8   A.   Yes.

9   Q.   We can end this by saying that for the ROC, R-O-C,

10   feature, the loop diagnostic test, and the dynamic D, those

11   features are not used. That is a true statement. Correct?

12   A.   I understand that's your position. I have no opinion.

13   Q.   So when TQ Delta's lawyer stands up in opening and says,

14   value depends on use, and you said you agree with that, you

15   can't tell this jury for these features how much it's used or

16   what the value of that use is. Correct?

17   A.   In a technical sense, no, I can't.

18   Q.   Not even in an economic sense, sir. Correct?

19   A.   I think we've been through this.

20   Q.   Okay. I'd like to ask you some questions about the

21   standard-setting organization process and FRAND. Is that

22   fair?

23   A.   Sure.

24   Q.   You agree that TQ Delta has promised to license the

25   standard essential patents on reasonable and

1   non-discriminatory terms. Correct?

2   A.   Yes.

3   Q.   And that's a contract that they made. Correct?

4   A.   Yes.

5   Q.   And so for a contract, to determine what the agreement

6   was or the promise was, we need to look to the words of the

7   contract. Fair?

8   A.   That's my understanding.

9   Q.   And what the words of this contract say is they cannot

10   discriminate on any basis. True?

11   A.   I don't think the 'on any basis' is in the contract, no.

12   Q.   It says don't -- you agree to license on

13   non-discriminatory basis. That's what the contract says.

14   Correct?

15   A.   No.

16   MR. DACUS: Can we pull up Exhibit 68? And go to

17   PDF 1. You also have to go to page 2, Mr. Carrillo. And can

18   you blow up the middle?

19   Q.   (BY MR. DACUS) Patent holder, prepared to license,

20   non-discriminatory basis. Correct?

21   A.   That's part of it, yes.

22   Q.   That is part of it. Correct?

23   A.   That's part of it.

24   Q.   And you know, sir, that --

25   MR. DACUS: We can take that down, Mr. Carrillo.

1   Q.   (BY MR. DACUS) -- requires that the implementors like

2   CommScope not be placed in a competitive disadvantage to other

3   implementors. Correct?

4   A.   No, I disagree.

5   Q.   Okay. Can you pull out your report? And can you turn to

6   page 9? Let me know when you're there, please, sir.

7   A.   Yes, I have it.

8   Q.   Were you -- you were here when the Judge read his

9   preliminary instructions to the jury, sir?

10   A.   Yes.

11   Q.   And one of the things he told them, they were going to

12   have to judge credibility of each witness that took the stand.

13   Correct?

14   A.   Yes.

15   Q.   And one of the things he told them to do is he said

16   compare what witnesses on that witness stand say today versus

17   what they've said or written in the past. You remember him

18   saying that?

19   A.   Yes.

20   Q.   And to the extent those things are not the same, you need

21   to listen and watch closely. Do you remember that?

22   A.   I do.

23   Q.   And so what you just said to the jury is, when I said

24   non-discrimination requires implementors not to be placed at a

25   competitive disadvantage to other implementors, you said you

1   disagree. Correct?

2   A.   Because it requires non-discriminatory terms and

3   conditions. That's correct.

4   Q.   It is true, sir, that what you said in your report is

5   that the non-discrimination provision requires that each such

6   implementor, including the Defendants, pay for standardized

7   technology on terms that do not place it at a competitive

8   disadvantage. Correct?

9   A.   That's right.

10   Q.   In other words, CommScope, whatever they're required to

11   pay, they should not be at a disadvantage to ZyXEL, their

12   largest competitor. Correct?

13   A.   That's right.

14   Q.   That's the purpose of RAND. Fair?

15   A.   Yes.

16   Q.   We shouldn't be at a competitive disadvantage to Zhone,

17   another one of our competitors. Correct?

18   A.   Exactly.

19   Q.   And to put a little finer point on this, sir, that means

20   that the industry participants, the people in this industry,

21   CPEs, must pay on similar terms. Correct?

22   A.   No, I disagree.

23   Q.   Can you open your report, sir, and can you turn to page

24   11? Turn To Paragraph 14. Tell me when you're there, sir.

25   A.   I have it, yes.

1   Q.   It's true in your report that you say, "I treat standard

2   essential technology as a common input for which all industry

3   participants must pay on similar terms." That's what you said

4   in your report. Correct?

5   A.   That's right, meaning DSL equipment suppliers, of course.

6   Q.   I'm sorry, sir?

7   A.   Industry participants means DSL equipment suppliers.

8   Q.   Certainly you know enough to know that ZyXEL is a DSL CPE

9   equipment supplier. Correct?

10   A.   Yes.

11   Q.   You know that Zhone is a DSL CPE equipment supplier.

12   Correct?

13   A.   That's right.

14   Q.   Those are the two people, we'll talk about more, but at

15   least those two people you agree we should not be

16   competitively disadvantaged when compared to. Correct?

17   A.   That's right.

18   Q.   And we should pay the same terms as ZyXEL or Zhone.

19   Correct?

20   A.   No, I disagree.

21   Q.   Okay.

22   THE COURT: Let me interrupt, counsel.

23   We are soon to have been in court two hours this morning.

24   We are going to take a short recess. This cross-examination

25   has additional time to go, ladies and gentlemen. So if you

1   will simply close your notebooks and leave them in your

2   chairs, follow all the instructions I've given you, and we'll

3   be back as soon as possible, but use this opportunity to

4   stretch your legs, get a drink of water, and we'll be back

5   shortly.

6   The jury's excused for recess.

7   (Whereupon, the jury left the courtroom.)

8   THE COURT: I'll try to keep this short, counsel.

9   The Court stands in recess.

10   (Brief recess.)

11   THE COURT: Be seated, please.

12   Mr. Dacus, are you prepared to continue with

13   cross-examination of the witness?

14   MR. DACUS: Yes, Your Honor.

15   THE COURT: All right. Let's bring in the jury,

16   please.

17   (Whereupon, the jury entered the courtroom.)

18   THE COURT: Please be seated.

19   We will continue with the Defendants' cross-examination

20   of Doctor Putnam.

21   Mr. Dacus, you may proceed.

22   MR. DACUS: Thank you, Your Honor.

23   Q.   (BY MR. DACUS) So where we left off, Doctor Putnam, was

24   your agreement that the non-discrimination requirement

25   requires that CommScope not be placed at a competitive

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 1    disadvantage to its competitors.  Correct?

 2    A.   Yes.

 3    Q.   And at least so far you've agreed that its direct

 4    competitors, those that make CPE equipment just like CommScope

 5    does, are ZyXEL and Zhone.  Correct?

 6    A.   Those are two of them, yes.

 7    Q.   Okay.

 8         MR. DACUS:  May I have the document camera, please?

 9    Q.   (BY MR. DACUS)  Now, there's been some discussion in your

10    direct about Nokia and the Nokia license.  You remember that?

11    A.   Yes.

12    Q.   And just -- I think it would be fair to put a fine point

13    on that for the jury to describe for them exactly what

14    equipment Nokia makes.  Is that fair?

15    A.   Sure.

16    Q.   So you remember this diagram that TQ Delta's lawyer put

17    up on the screen yesterday?

18    A.   Yes.

19    Q.   Okay.  This is the DSL network.  Correct?

20    A.   Yes.

21    Q.   And so the CPEs that are at issue in this case are these

22    pieces of equipment that are in people's homes.  Fair?

23    A.   Yes.

24    Q.   And that's what CommScope makes, that's what ZyXEL makes,

25    and that's what Zhone makes.  Correct?
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1   A.   Yes.

2   Q.   Nokia, on the other hand, they make this thing called a

3   DSLAM right here. Correct?

4   A.   Yes.

5   Q.   That's a different piece of equipment. Correct?

6   A.   It is different, yes.

7   Q.   And as Mr. Davis said at length yesterday, it operates

8   very differently. Correct?

9   A.   Okay.

10   Q.   Were you here yesterday when he described this thing

11   called a CO? Were you here for that?

12   A.   I'm not -- I don't recall, actually.

13   Q.   Do you agree, sir, consistent with what he said, that

14   these CPEs are in the house so that you have to get a new one

15   each time you move or you build a new house. You agree with

16   that. Correct?

17   A.   Yes.

18   Q.   But these COs apparently have multiple ports, operate

19   differently, and don't need to be replaced nearly as much.

20   You understand that, sir?

21   A.   Yes.

22   Q.   So we can agree that Nokia sells a different piece of

23   equipment than what CommScope does. Fair?

24   A.   That's true.

25   Q.   If we want to talk about who's a direct competitor here,

1   it's CommScope, ZyXEL, and Zhone. We can agree on that.

2   A.   They all sell CPE equipment. That's true.

3   Q.   You agree, sir, that this RAND obligation, this RAND

4   promise, has a very important purpose and policy behind it at

5   the ITU. Correct?

6   A.   Yes.

7   Q.   And the primary purpose is to prevent what they call

8   holdup. Correct?

9   A.   That is one purpose, yes.

10   Q.   And holdup is where with a patent owner who participates

11   in the standard process who shows up years later after the

12   standard is adopted and demands unreasonable amounts of money

13   from those using the standard. Correct?

14   A.   No, I disagree.

15   Q.   Okay. You think that's okay to do that? You think it's

16   okay to participate in the standard organization, make a RAND

17   promise, and then show up years later after the standard's

18   adopted, and claim unreasonable amounts of money. Is that

19   your testimony?

20   A.   No, that's not my testimony and it's not okay.

21   Q.   Okay. You agree that, at least as you said, a purpose of

22   the RAND promise is to prevent holdup. Is that correct?

23   A.   That's true.

24   Q.   And to use your terms, to prevent people from jacking up

25   the amount of royalties that they request in the future.

1   True?

2   A.   That's exactly right.

3   Q.   And that policy and that purpose is particularly

4   important and implicated in the very facts of this case.

5   Isn't that right?

6   A.   I'm not sure what you mean.

7   Q.   You know, sir, that Aware, who is the owner of the

8   patents, they did not make a product. Did you hear that

9   testimony from Mr. Tzannes yesterday?

10   A.   Yes.

11   Q.   The only thing that Aware did is collect what he said

12   were license revenues. Did you hear that part?

13   A.   I think that mischaracterizes his testimony.

14   Q.   So you agree they don't build a product. Correct?

15   A.   That's true.

16   Q.   You do agree that they were there or part of their

17   business was collecting license revenues on their patents.

18   Correct?

19   A.   That is part of their business, yes.

20   Q.   And the truth is, sir, the reason they participated at

21   the ITU was to try to get the Aware methods adopted into these

22   standards. Correct?

23   A.   Of course.

24   Q.   And the reason they wanted to do that is because that's

25   their source of revenue, is to try to make money on patents.

1   Correct?

2   A.   No, that's incorrect.

3   Q.   Are you -- is it your testimony that they -- that

4   Aware -- part of Aware's business was not attempting to make

5   money by licensing on its patents?

6   A.   That's part of the business. It's a small part. So yes.

7   Q.   The ITU, sir, is keenly aware that people participate and

8   show up at those standard-setting organizations and their

9   purpose is to try to get the patent owners' technology adopted

10   into the standard so that they can make money on the patent.

11   True?

12   A.   Not necessarily, no.

13   Q.   Not necessarily, but the ITU knows that happens.

14   Correct?

15   A.   Of course. That's why they have the policy.

16   Q.   And that's exactly what Aware was doing in this case.

17   They had patents, they didn't make a product, they show up at

18   the standard-setting organization, they do everything they can

19   to get their methods adopted into the standard so that they

20   can make money on their patents. Correct?

21   A.   I'm afraid I can't agree with that.

22   Q.   Okay. But what the ITU wants to prevent is someone like

23   Aware or someone who purchases Aware's patents from showing up

24   later on after the standard is adopted and demanding

25   unreasonable amounts of money. Correct?

1   A.   That would be a bad thing, yes.

2   Q.   Because, as you said on your direct, once the standard is

3   adopted, it's mandatory that you have to use it. Right?

4   A.   That's right.

5   Q.   And that's why the ITU says upfront, look, if you have a

6   patent, you've got to agree to be non-discriminatory and

7   reasonable if we put your method in this standard. True?

8   A.   Of course.

9   Q.   And you also know the ITU says, look, if you don't agree

10   to be reasonable and non-discriminatory, we're not going to

11   include your contribution in the standard. Correct?

12   A.   That's my understanding, yes.

13   Q.   I'd like to ask you some questions about methods,

14   potential methods of how to value a royalty or a patent. Is

15   that fair?

16   A.   Sure.

17   Q.   Okay. You agree that there are different methods that

18   can be used by someone in your -- an economist like you.

19   Correct?

20   A.   That's fair.

21   Q.   One of them is an income approach. Correct?

22   A.   I've heard of that.

23   Q.   And the income approach is essentially basing the value

24   on income derived from use of the patents through looking at

25   the cash flows or the profits of the accused infringer.

1   Correct?

2   A.   That seems fair.

3   Q.   The other method -- and you did not use the income

4   approach here. Correct?

5   A.   That's right.

6   Q.   The other method that you can use is what's called the

7   market approach or the comparable license approach. Correct?

8   A.   That's another method, yes.

9   Q.   Okay. You did not use that method here. Correct?

10 A.   I would say that's not true.

11 Q.   You used a cost savings method. Correct?

12 A.   I used both methods.

13 Q.   You think here you used a market approach using

14 comparable licenses?

15 A.   Yes. We discussed comparable licenses extensively.

16 Q.   Okay. You agree, sir, that the first and most reliable

17 indicator of a patent's value and a reasonable royalty is the

18 royalty received by a patent owner for licensing of the

19 patents-in-suit. Correct?

20 A.   As a general proposition, that's very true, yes.

21 Q.   Okay. And I've heard some folks like you use a house

22 analogy, in that if you're going to go buy a house, you would

23 look to see what that particular house sold for to determine

24 its value. Correct?

25 A.   I've heard that analogy, too. Yes.

1   Q.   And you agree with it, too. Correct?

2   A.   It's a way of illustrating the process.

3   Q.   And that's what we can do here and you can do, the jury

4   can do, is look and see what these seven patents have been

5   licensed for in the past as, according to you, the most

6   reliable indicator of the patent's value and an appropriate

7   royalty. Correct?

8   A.   I'm afraid I disagree.

9   Q.   Can you open your report, please, sir? And can you turn

10   to page 51? And if you'd look at paragraph 101 and let me

11   know when you are there.

12   A.   I have it.

13   Q.   What you wrote in your report that you signed as truthful

14   was, the first and most reliable index of a patent's value is

15   the royalties received by the patentee for the licensing of

16   the patent-in-suit. Correct?

17   A.   That's true.

18   Q.   Okay. So what that's saying is if you want to know what

19   these seven patents are, look and see if there's a royalty or

20   a patent license on them, and that's the best and first

21   indicator. Correct?

22   A.   Yes.

23   Q.   And so we know -- let's just take ZyXEL as an example.

24   These seven patents were licensed to ZyXEL. Correct?

25   A.   Yes.

1   Q.   Not only these seven but at least 93 more. Correct?

2   A.   I haven't counted, but if you say so.

3   Q.   Were you here when I did this chart with Ms. Divine?

4   A.   I certainly was.

5   Q.   Who -- you agree that Ms. Divine probably knows more

6   about the exact terms of those licenses that TQ Delta has

7   entered into than you do. Correct?

8   A.   Sure.

9   Q.   So you were here when Ms. Divine said that, yeah, there

10   was at least a hundred patents included in that ZyXEL patent

11   license. Correct?

12   A.   Yes.

13   Q.   So seven that are here at issue, plus at least 93 more.

14   Correct?

15   A.   Okay.

16   Q.   Gave ZyXEL the right to produce an unlimited number of

17   products. Correct?

18   A.   There was no limitation. That's right.

19   Q.   That means unlimited. Correct? Is that right?

20   A.   Yes.

21   Q.   They got worldwide rights. Correct?

22   A.   Yes.

23   Q.   We can agree that worldwide is generally more valuable

24   than just U.S. Correct?

25   A.   No, I disagree with that statement.

1   Q.   Okay. ZyXEL paid a total of $8.9 million. Correct?

2   A.   Yes.

3   Q.   So if we go back to where we started this, you said the

4   first and most reliable indicator of a patent's value and the

5   amount of royalty is what those patents have been licensed for

6   in the past. True statement. Correct?

7   A.   In a commercial setting, that statement is true. Not at

8   trial.

9   Q.   Let's be clear, sir. You understand that what you wrote

10   in your report about the first and most reliable index of a

11   patent's value are the royalties received by the patentee for

12   the licensing of the patents-in-suit, you have an

13   understanding that that is the law. Correct?

14   A.   Of course. That's why I wrote it.

15   Q.   Right. So the first and most reliable indicator of a

16   patent's value are the royalties received for the

17   patents-in-suit. Fair?

18   A.   In a market setting, that's true.

19   Q.   In a lawsuit setting. Correct?

20   A.   No, I disagree.

21   Q.   Do you see in your report where you wrote the words

22   *Georgia-Pacific* factor 1? Do you see where you wrote that?

23   A.   Yes.

24   Q.   You know that that's a factor that this Court is going to

25   instruct the jury on as to what they should look at in

1   determining the value of a patent. Correct?

2   A.   Of course.

3   Q.   And that's why you wrote it in your report. Correct?

4   A.   That's exactly right.

5   Q.   So when you say in a commercial setting, the truth is in

6   a lawsuit setting that this jury is here to determine, you

7   said the first and most reliable indicator of a patent's value

8   are the royalties received by the patentee for the licensing

9   of patents-in-suit. Correct?

10   A.   I'm afraid that's inaccurate.

11   Q.   Okay. The reason you and a jury and anyone determining

12   the indicator or the value of a patent and a royalty should

13   look to a patent and particularly the patent-in-suit is

14   because that removes the need to guess as to what the value

15   would have been. Right?

16   A.   That's correct.

17   Q.   In other words, we don't need to think hypothetically

18   what would somebody have paid for these seven patents; we

19   know. True?

20   A.   If they had bargained, that's correct, yes.

21   Q.   Now, you do agree, and it is true, that when we're

22   looking at the licenses for the patents-in-suit, we might need

23   to make adjustments based on the number of patents, whether

24   it's worldwide, and whether or not there is a certain

25   limitation on the units. Correct?

1   A.   Maybe yes, maybe no.

2   Q.   In other words, a hundred patents are more valuable than

3   seven patents. Correct?

4   A.   Not necessarily, no.

5   Q.   Okay. So you think folks pay in a license agreement the

6   same for a hundred as they do for seven. That's your

7   testimony?

8   A.   They may very well.

9   Q.   You presented some slides to the jury during your direct

10 testimony. Correct, sir?

11 A.   Yes.

12 Q.   And at least with respect to Nokia, you presented a

13 comparison -- direct comparison of the dollars paid by Nokia

14 to the dollars paid or that you attempt to have CommScope pay.

15 Correct?

16 A.   Yes.

17 Q.   But you didn't do that for ZyXEL, did you, sir?

18 A.   It's not as comparable, no. That's right.

19 Q.   So your position to the jury is that a direct competitor

20 who licensed the exact same patents, seven patents, that are

21 in this case, that's not comparable. Is that your testimony?

22 A.   That isn't what I said, and no.

23 Q.   Were you here -- you were here when Ms. Divine testified?

24 A.   I was.

25 Q.   You heard about this group that did a valuation by the

1   name Stout?

2   A.   Yes.

3   Q.   You heard those are very qualified accountants and

4   economists. Correct?

5   A.   Yes.

6   Q.   You heard her say they did that valuation in order to

7   submit it to the Securities and Exchange Commission. Correct?

8   A.   I believe so.

9   Q.   And to the taxing authorities. Correct?

10 A.   Yes.

11 Q.   Very important that it be thorough and accurate.

12 Correct?

13 A.   Yes.

14 Q.   And you know, sir, I presume, that what Stout said to do,

15 Stout said to look at the income method of valuing these

16 patents. You know that?

17 A.   Yes.

18 Q.   The thing that you did not do. Correct?

19 A.   That was their method at the time, yes.

20 Q.   Right. So qualified accountants and economists,

21 performing a calculation that needs to be absolutely accurate,

22 they used income approach. Correct?

23 A.   Not for a damages calculation, but yes, they did.

24 Q.   For valuation. Correct, sir?

25 A.   Yes.

1   Q.   They also used the comparable license approach. Correct?

2   A.   I don't recall specifically.

3   Q.   Do you recall that they used the market approach?

4   A.   I don't recall specifically.

5   MR. DACUS: Can you pull up Exhibit 78, please, Mr.

6   Carrillo, and could you go to page 5? Can you blow up this

7   portion right here, Mr. Carrillo, all the way down to the next

8   paragraph? Thank you.

9   Q.   (BY MR. DACUS) Do you see what Stout said to do is, for

10   each of the portfolios, we determined it would be necessary to

11   rely upon a hybrid approach incorporating aspects of an income

12   approach and a market approach. Correct?

13   A.   Yes.

14   Q.   Market approach meaning look at comparable licenses.

15   Correct?

16   A.   Yes.

17   Q.   "We explored but did not rely on a cost

18   approach." Correct?

19   A.   Yes.

20   Q.   And so what you just spent the better part of an hour

21   talking to the jury about was this cost savings approach that

22   you did. Correct?

23   A.   No.

24   Q.   You didn't present to them a cost savings approach?

25   A.   I presented a cost savings approach, not a cost approach.

1   A cost approach means something different.

2   Q.   You presented to the jury a cost savings approach.

3   Correct?

4   A.   That's true.

5   Q.   Okay.

6   MR. DACUS: We can take that down, Mr. Carrillo.

7   Q.   (BY MR. DACUS)   I'd like to ask you some questions about

8   that cost savings approach that you used, if that's okay.

9   A.   Sure.

10   MR. DACUS: May I have the document camera?

11   Q.   (BY MR. DACUS)   So my understanding from what you

12   presented is this was sort of the summary of your cost savings

13   approach.   Correct?

14   A.   It's a good part of it, yes.

15   Q.   Okay. Now, let's be clear. The cost savings that we're

16   talking about here are cost savings to the telephone carrier.

17   Correct?

18   A.   Yes, that's right.

19   Q.   So in this instance AT&T. Right?

20   A.   Yes.

21   Q.   These are not cost savings to CommScope. Correct?

22   A.   Of course not.

23   Q.   Do you understand that CommScope says that's the wrong

24   basis for a calculation of damages. You understand that?

25   A.   They've said that, yes.

1 Q.   And you agree, sir, that if the jury agrees with that,

2 they can actually disregard your entire calculation. Correct?

3 A.   They have to make up their own mind. Of course.

4 Q.   Right. So what your position is that CommScope should

5 pay for the billions of savings that you claim AT&T got.

6 Correct?

7 A.   Yes.

8 Q.   You do know, sir, that -- well, do you agree that in

9 patent law what we're supposed to be measuring is the value to

10 the alleged infringer? Do you understand that?

11 A.   Of course.

12 Q.   So the alleged infringer here is CommScope. Right?

13 A.   They make the products that AT&T uses. That's right.

14 Q.   They're the alleged infringer. Correct?

15 A.   Yes.

16 Q.   And yet what you're trying to assess to CommScope, or at

17 least what you claim, were savings to AT&T. That's a true

18 statement. Right?

19 A.   That's correct.

20 Q.   Part of this calculation that you did, sir, relies on the

21 analysis that Doctor Cooklev did. Correct?

22 A.   Yes.

23 Q.   And were you here for -- you were not here for Doctor

24 Cooklev's testimony yesterday, were you?

25 A.   That's correct.

1   Q.   The analysis that Doctor Cooklev and you did is what you

2   call a knockout process. Is that right?

3   A.   We used something called knockout words as part of that

4   process, yes.

5   Q.   And you relied on Doctor Cooklev's work. Is that true?

6   A.   Of course.

7   Q.   I think you showed this slide to the jury. Correct?

8   A.   Yes.

9   Q.   So just so we're clear, if the jury believes that it is

10   inappropriate to look at the savings to AT&T and then try to

11   assess those to CommScope, they can disregard your

12   calculation. Fair?

13   A.   I disagree.

14   Q.   Okay. Your entire calculation, sir, is based on the

15   savings to AT&T. Correct?

16   A.   Of course.

17   Q.   In addition, if the jury finds or believes that Doctor

18   Cooklev's analysis is not reliable, they can also disregard

19   your calculation. Correct?

20   A.   Again, I disagree.

21   Q.   You relied on Doctor Cooklev. Correct?

22   A.   Yes.

23   Q.   And you relied on him to come to the conclusion that

24   there are 33 essential patents in these DSL standards that

25   we're talking about. Correct?

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 1   A.    In the sample that he analyzed, yes.

 2   Q.    Well, are you saying there's more than that?

 3   A.    I am saying there's more than that, yes.

 4   Q.    There are more than 33 essential patents in the DSL

 5   standards at issue?

 6   A.    That's what I calculated, yes.

 7   Q.    And how many did you calculate to be?  How many patents

 8   in the DSL standards at issue in this case?

 9   A.    71 patent families, as it says on the right-hand side of

10   the graph, that are essential to one or more DSL standards.

11   Q.    The reason you did this calculation, sir, is, at least

12   the purpose behind it was, to try to determine what TQ Delta's

13   percentage or proportion was of the essential patents in the

14   standards.  Correct?

15   A.    That's part of it, yes.

16   Q.    And so what -- it's true, sir, that basically you're

17   trying to figure out what portion of the pie does TQ Delta

18   have.  True?

19   A.    That's fair.

20   Q.    And so if this 71 is actually 200, then that pie is a

21   whole lot bigger and their slice is a whole lot smaller.

22   Correct?

23   A.    That would be the math, yes.

24   Q.    So this is a very important part of your calculation.

25   True?
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1   A.   Yes.

2   Q.   Because if this number is much bigger, TQ Delta's

3   ultimate number is much, much smaller. Fair?

4   A.   Again, that's the math.

5   Q.   And that all relies back on this Cooklev calculation,

6   selection of keywords, elimination of patents. Right?

7   A.   No, I disagree. That mischaracterizes the process.

8   Q.   Okay. What you started with was almost 15,000 patents

9   that were potentially essential to the standard. Correct?

10   A.   Yes.

11   Q.   And then through this process you narrowed it down to

12   say, no, out of that 15,000 that people declared to be

13   essential, there's really only 71. That's your conclusion.

14   Correct?

15   A.   No, that mischaracterizes the process.

16   Q.   Well, that's what you say here--33 were determined to be

17   essential. Correct?

18   A.   Yes.

19   Q.   And then you did another calculation to say, well, out of

20   that 33, 71 families are essential to accused DSL standards.

21   Correct?

22   A.   That's correct.

23   Q.   Were you here -- you were not here when Doctor Cooklev

24   testified?

25   A.   I was not.

1   Q.   Did you know that he admitted on the stand that his

2   analysis actually excluded a patent in this very suit as being

3   non-essential but yet one of the technical experts for TQ

4   Delta testified that it was essential? Were you here for

5   that?

6   A.   Again, that mischaracterizes the process. It wasn't

7   excluded.

8   Q.   Sir, what you ultimately determined, as your word, there

9   were 33 essential patents. Correct?

10   A.   No.

11   Q.   71 essential patents. Correct?

12   A.   That was Doctor Cooklev's determination, yes.

13   Q.   And that's my point, sir. You relied on Doctor Cooklev,

14   who in this courtroom also admitted yesterday that for the

15   '411 Patent, he identified it as essential in the work that he

16   did for you, but in this courtroom TQ Delta says it's not

17   essential. Do you know that?

18   A.   That mischaracterizes the testimony.

19   Q.   Were you here for his testimony?

20   A.   I read the transcript.

21   Q.   You do agree that your work, as you just said, relies on

22   the accuracy of what Doctor Cooklev did. Fair?

23   A.   Yes.

24   Q.   Now, you know, sir, that these cost savings from AT&T

25   that you made your calculation on, those, quote, unquote,

1   savings are actually just the deferral of costs. Correct?

2   A.   No, that's incorrect.

3   MR. DACUS: Can you pull up the report, Exhibit 3 to

4   the report, please, Mr. Carrillo?

5   Q.   (BY MR. DACUS) And just so we're clear, sir, I want to

6   be clear in my question, you agree that the cost savings are a

7   deferral, not a savings but a deferral. Correct?

8   A.   Not necessarily.

9   Q.   So you disagree with that?

10   A.   It's true in some cases and not in others.

11   MR. DACUS: It's the previous page, Mr. Carrillo.

12   Thank you.

13   Q.   (BY MR. DACUS) So you recognize this, sir, as an exhibit

14   that you put in your report. Correct?

15   A.   Yes.

16   Q.   This is actually the basis for your calculation for these

17   cost savings. Correct?

18   A.   That's why we worked through the math, yes.

19   Q.   That's what you gave to us, to your lawyers, and to the

20   Judge as the basis for your calculation that you've presented

21   here today. Correct?

22   A.   Yes.

23   MR. DACUS: And if you'd scroll down, Mr. Carrillo,

24   to the footnote a.

25   Q.   (BY MR. DACUS) So right here in footnote a, sir, you are

1   describing --

2   MR. DACUS: We can scroll back up if we could, Mr.

3   Carrillo, to where the a is.

4   Q.   (BY MR. DACUS) -- average cost savings afforded by DSL

5   technology. Did I read that correctly?

6   A.   Yes.

7   Q.   That's the AT&T savings. Correct?

8   A.   Yes.

9   Q.   But --

10   MR. DACUS: Now scroll back down to a.

11   Q.   (BY MR. DACUS) You put us a footnote and said, but this

12   reflects a deferral of network operator investment in

13   fiberoptic deployments. Correct?

14   A.   Of course.

15   Q.   So it actually is a deferral. That's what you wrote.

16   Correct?

17   A.   Where that is explained in the text of the report, of

18   course.

19   Q.   At the end of the day, sir, in this calculation, you

20   calculated that the appropriate royalty rate is 33 cents per

21   patent per standard. Correct?

22   A.   Per unit, that's right.

23   Q.   Per unit. So that the jury understands --

24   MR. DACUS: We can take that down for now, Mr.

25   Carrillo.

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 1    Q.    (BY MR. DACUS)  So that the jury understands, the

 2    original idea for you to use this cost saving methodology came

 3    from Mr. Marcos Tzannes.  Correct?

 4    A.    Of course.

 5    Q.    You said of course?

 6    A.    Yes.

 7    Q.    So that's the gentleman who testified here on Friday.

 8    Correct?

 9    A.    He invented the patents.  Yes, that's right.

10    Q.    Were you here when he also said -- when he was asked

11    questions about business, he said, don't ask me any business

12    questions, I'm just an engineer?  Maybe even described himself

13    as an engineering geek.  Were you here for that?

14    A.    Yes.

15    Q.    And he said expressly multiple times, I'm not the

16    business guy, I don't understand finance.  Do you understand

17    that?

18    A.    Of course.

19    Q.    And yet you, at $740 an hour, as the basis for your

20    calculation, you relied on Marcos Tzannes.  Correct?

21    A.    Of course, for the technical portion of the testimony.

22    Q.    No, sir.  For your economical calculation of damages.

23    Correct?

24    A.    That's inaccurate.

25    Q.    You got the idea to do this cost savings method from
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1   Marcos Tzannes. That is a true statement. Correct?

2   A.   That statement is true, yes.

3   Q.   At the end of the day, this 33 cents per patent per unit,

4   you wind up assessing $2.99 per CPE as a proposed royalty in

5   this case. True?

6   A.   If it practices all the patents, yes.

7   Q.   But -- I want to ask you about that, but to start with,

8   even you would admit that TQ Delta's, quote, unquote, standard

9   rate is only $1.85. True?

10   A.   That's the offer. That's right.

11   Q.   That's their standard rate. Correct?

12   A.   Yes.

13   Q.   So even -- to start with the easy questions, even you

14   admit that TQ Delta and you seek to upcharge 60 percent over

15   above what the standard rate is. Correct?

16   A.   No, that's incorrect.

17   Q.   You agree that $2.99 is 60 percent above $1.85. Correct?

18   A.   The math is right, but it's not an upcharge.

19   Q.   And I guess on top of that, you seek to charge them

20   another 7 million based on what you said this morning.

21   Correct?

22   A.   They are both forms of compensation.

23   Q.   Another 20 cents? Is that what you said?

24   A.   That's right.

25   Q.   So we are now up to 3.20 a unit?

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1    A.    I think it's 3.19, but yes.

2    Q.    $3.19.  And the standard royalty is $1.85.  Correct?

3    A.    Under the standard rates, that's right.

4    Q.    But we know and you know, sir, that what our competitors

5    actually paid is much less than that $1.85.  True?

6    A.    Not for damages, no, it's not true.

7    Q.    For a license, they paid less than $1.85.  Correct?

8    A.    That statement is true.

9    Q.    And, by the way, you know that the ZyXEL license was

10   taken after TQ Delta sued them.  Correct?

11   A.    Yes.

12          MR. DACUS:  Can we pull up Exhibit 37, please, Mr.

13   Carrillo?

14   Q.    (BY MR. DACUS)  You recognize this, sir, as the license

15   between ZyXEL and TQ Delta?

16   A.    Yes.

17          MR. DACUS:  And can you go to page 16, Exhibit A,

18   Mr. Carrillo?  Thank you.

19   Q.    (BY MR. DACUS)  You know, of course, at the top here are

20   the alleged standard rates.  Correct?

21   A.    Yes.

22   Q.    And just so we're clear, the alleged standard rate for

23   G.INP, which is at issue in this case, TQ Delta says is

24   12-and-a-half cents.  Right?

25   A.    Yes.
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 1    Q.    You seek to charge just for G.INP 33 cents.  Correct?  I

 2    take it back.  Let me withdraw the question.

 3          You actually seek to charge 66 cents.

 4    A.    Well, I'm not charging anybody.

 5    Q.    That's fair enough.

 6    A.    I calculated the --

 7    Q.    That's fair enough.  Let me ask a better question.

 8          TQ Delta seeks from CommScope 66 cents for every unit

 9    related to G.INP.  That is a true statement.

10    A.    That's the measure of damages, yes.

11    Q.    They say the standard rate is 12-and-a-half; here, they

12    want the jury to give them 66.  True?

13    A.    True.  For U.S. sales, yes, that's right.

14    Q.    And that is five times, 66 cents is five times what the

15    alleged standard rate was for ZyXEL.  Correct?

16    A.    That's the math, yes.

17    Q.    That's our largest competitor.  Correct?

18    A.    Yep, that's right.

19    Q.    And you -- your testimony to the jury is that charging

20    five times the standard rate is in compliance with the

21    non-discrimination requirement in the RAND promise?

22    A.    No, that's not my testimony.

23    Q.    Because you know that charging five times more to

24    our -- to us than our competitor would violate RAND.  Correct?

25    A.    If that were an offered license, that would be true, but
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1   this is damages.

2   Q.   Do you understand, sir, that damages in this case are

3   constrained by the RAND obligation? Do you understand that?

4   A.   No, I firmly disagree with that.

5   Q.   Let's be really clear here. You have done your work in

6   this case under the assumption that RAND does not constrain

7   the damages to be awarded. Is that true?

8   A.   That's right. RAND is an offer to be prepared to

9   license. That preparation to license has passed.

10   Q.   So the work you've done in this case, as I understand it,

11   it has no ceiling and no constraint based on that RAND promise

12   that was made. Is that a fair statement?

13   A.   No, that's completely inaccurate.

14   Q.   Well, what is the limit then? Is there any limit at all

15   on what TQ Delta can charge to CommScope in this lawsuit?

16   A.   Well, the Court will instruct the jury on the law, but my

17   understanding is that the law says that the royalty must be a

18   reasonable royalty and adequate to compensate for the

19   infringement.

20   Q.   And if the Judge instructs the jury that RAND does place

21   a constraint on what can be awarded, you would agree that

22   you've not done that. True?

23   A.   There's two parts to that question. The Judge will

24   obviously instruct the jury on the law.

25   Q.   We can agree on that.

1   A.   And I have not in a damages context been constrained by a

2   RAND commitment because that's a commitment by TQ Delta to

3   offer certain terms and conditions.

4   Q.   We also know, sir, that what was actually paid by our

5   largest competitor, ZyXEL, is much less than these standard

6   rates. True?

7   A.   Of course.

8   Q.   So --

9   A.   I'm sorry. I'm sorry. I didn't understand. I answered

10   too quickly. They paid the standard rates.

11   Q.   Your testimony is that ZyXEL paid the standard rates?

12   A.   Yes.

13   Q.   Let's just focus on what ZyXEL actually paid from 2020

14   through the end of the patent terms.

15   MR. DACUS: Can you highlight that, Mr. Carrillo?

16   Can you scroll down so that we have the full bottom half of

17   the page? Thank you.

18   Q.   (BY MR. DACUS) So you understand from Ms. Divine's

19   testimony that this is the actual calculation of how they

20   determined the amount that ZyXEL would pay in the royalty.

21   You understand that, sir?

22   A.   Yes.

23   Q.   And you remember that there was an adjustment or a

24   discount or whatever you want to call it for 79 percent. Do

25   you remember that?

1   A.   I do remember the testimony.

2   Q.   So rather than pay the standard rates, the first

3   adjustment that ZyXEL got was a 79 percent reduction.

4   Correct?

5   A.   Remember, it's -- well, these are part of the standard

6   rates. It's a package of terms and conditions.

7   Q.   Sir, where I started this with you about an hour ago was

8   to say what you said was the first place and the best place

9   you should look to determine the value of a patent and a

10   reasonable royalty is what royalties have been paid in the

11   past for the patents-in-suit. Correct?

12   A.   In a commercial setting, yes.

13   Q.   So that's what I'm trying to figure out is not what

14   somebody window-dressed with, what did somebody pay. Does

15   that sound fair?

16   A.   Of course. It's a package. Excuse me. It's a package

17   of terms and conditions. The rates are shown at the top, but

18   they don't reflect all the terms and conditions, and I think

19   that's an extremely important point as I tried to emphasize in

20   my direct testimony.

21   Q.   What we're trying to determine, according to you, an hour

22   ago, sir, is CommScope competitively disadvantaged versus

23   ZyXEL. That's what you said. Correct? That's what the RAND

24   obligation requires. Correct?

25   A.   It's trying to prevent competitive disadvantage. That's

1   right.

2   Q.   Right. So we know that what TQ Delta says -- well, TQ

3   Delta says $3.19 per CPE unit. Correct?

4   A.   No, that's incorrect.

5   Q.   What's incorrect about it?

6   A.   That's not an offer; that's damages for past

7   infringement.

8   Q.   That's what they're trying to get in this lawsuit.

9   Correct?

10   A.   But we're not bargaining here, Mr. Dacus.

11   Q.   Sir --

12   A.   This is a compensation looking backwards for

13   infringement, not an offer going forward for a license.

14   Q.   You understand that we disagree with your -- your

15   interpretation. Right, sir?

16   A.   That's your position, I guess.

17   Q.   And what TQ Delta seeks in this lawsuit is $3.19 per

18   unit. Correct?

19   A.   For damages, yes.

20   Q.   And we know that what ZyXEL paid was not the standard

21   rate, but they got a 79 percent discount, and on top of that

22   they got another 25 percent discount. Correct?

23   A.   Those are part of the conditions that ZyXEL met. That's

24   right.

25   Q.   So if we just took --

1   MR. DACUS: If we scrolled up, Mr. Carrillo.

2   Q.   (BY MR. DACUS) You remember I did this math with Ms.

3   Divine. If we just took the VDSL standard rate of 90 cents

4   and we gave a reduction of 79 percent and then another 25

5   percent, then what ZyXEL actually paid is 14 cents. Correct,

6   sir?

7   A.   I disagree.

8   Q.   That's what -- you agree, sir, that that's what ZyXEL

9   paid in the year 2020. Correct?

10   A.   It's an inaccurate statement.

11   Q.   And what TQ Delta seeks from CommScope in this lawsuit is

12    $3.19 per unit. Correct?

13   A.   For damages, that's correct.

14   Q.   And you think that the difference between those does not

15   present a competitive disadvantage to CommScope?

16   A.   I think you're comparing apples and oranges. So, no, I

17   don't.

18   Q.   So your position is, TQ Delta's position is, that in this

19   lawsuit we can be competitively disadvantaged. Is that true?

20   A.   I have no opinion, but I don't think so.

21   Q.   One last question on this if I could ask you this.

22   A.   Sure.

23   Q.   You see this word non-Lantiq DSL?

24   A.   Yes.

25   Q.   Do you know why that's there?

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 1     A.    Because ZyXEL purchased certain chips from Lantiq.

 2     Q.    Right.

 3     A.    And those chips are already licensed.  And so Zyxel only

 4     has to pay for the units it sells that don't use Lantiq chips.

 5     Q.    So let's talk about what that means.  Does that sound

 6     fair?

 7     A.    Sure.

 8     Q.    Because what we're talking about is whether or not

 9     CommScope is competitively disadvantaged versus ZyXEL.

10     Correct?

11     A.    Yes.

12           MR. DACUS:  Your Honor, may I scoot the flip chart

13     up and use it?

14           THE COURT:  You may.

15           MR. DACUS:  Thank you.

16     Q.    (BY MR. DACUS)  So the way it works in this industry,

17     sir, is somebody makes a semiconductor chip.  Correct?

18     A.    Okay.

19     Q.    Is that true?  Do you know enough to know that?

20     A.    Well, yes, I know that somebody makes chips.  That's

21     true.

22     Q.    And then they sell them to the CPE manufacturer.

23     Correct?

24     A.    Yes.

25     Q.    And then that CPE manufacturer sells its product to some
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1   telephone carrier. Correct?

2   A.   Yes.

3   Q.   I put AT&T, but it could be any carrier. Correct?

4   A.   Sure.

5   Q.   And so if we want to know specifically what's going on

6   with ZyXEL, we know that they buy some of their chips from

7   Lantiq. Correct?

8   A.   Yes.

9   Q.   And then ZyXEL sells to AT&T, Verizon, those types of

10   carriers. Right?

11   A.   That's right.

12   Q.   So we are directly competing. We CommScope are directly

13   competing against ZyXEL. Correct?

14   A.   Yes.

15   Q.   So just to kind of set the stage here, our chip

16   manufacturer is Broadcom. Right?

17   A.   Yes.

18   Q.   I just abbreviated CommScope with CS. Is that fair?

19   A.   Sure.

20   Q.   And then we sell to AT&T. Do you understand that?

21   A.   Yes.

22   Q.   And what CommScope seeks in this lawsuit is for -- what

23   TQ Delta seeks is for CommScope to pay $3.20 for every unit

24   that we sell. True?

25   A.   As compensation, yes.

1   Q.   Never sought a license. TQ Delta never sought a license

2   from Broadcom. Correct?

3   A.   That's correct.

4   Q.   Yet in our direct competitor, our largest competitor

5   ZyXEL, they paid nothing for the chip that they received.

6   Correct?

7   A.   You mean they paid nothing in royalties to TQ Delta? Is

8   that your point?

9   Q.   Or to Aware, either one. Correct?

10   A.   Well, they didn't pay -- yes, they didn't license these

11   patents directly. That's true. They were licensed through

12   the purchase of the Lantiq chip.

13   Q.   Aware licensed these patents, the very patents we're

14   talking about, to Lantiq. Correct?

15   A.   Yes.

16   Q.   For somewhere between 6 percent and 10 percent of the

17   chip cost. Correct?

18   A.   No.

19   Q.   Have you seen that royalty statement that has the

20   graduated volume discount from 6 percent down to 1 percent?

21   A.   That's correct.

22   Q.   And that's based on the cost or the sales price of the

23   chip. Correct?

24   A.   Yes.

25   Q.   And so, as you said, by virtue of Lantiq having a license

1   from Aware, ZyXEL pays zero. Correct?

2   A.   Only on the Lantiq chips, that's true.

3   Q.   On the Lantiq chips. Correct?

4   A.   Yes.

5   Q.   On non-Lantiq chips, ZyXEL pays what we just calculated.

6   The actual payment is as little as 14 cents. Correct?

7   A.   Again, that's incorrect.

8   Q.   Did I do the math correctly?

9   A.   I don't think you did, actually.

10   MR. DACUS: Can we scroll down, Mr. Carrillo? Let's

11   go back up to the top.

12   Q.   (BY MR. DACUS) Do you see right here, it says, 90 cents

13   for VDSL. Correct?

14   A.   Yes.

15   MR. DACUS: Can we scroll down, Mr. Carrillo?

16   Q.   (BY MR. DACUS) They got a 79 percent discount here, 25

17   percent more right here. That's 14 cents?

18   A.   The 79 percent is not a discount. It reflects the

19   pre-payment of the royalties which is a condition of the

20   contract. CommScope did not prepay royalties, and so it

21   doesn't get the same condition.

22   The 25 percent is an early mover discount. CommScope is

23   not an early mover. It doesn't qualify for that discount.

24   And so that math can't be compared to CommScope's damages

25   in this case.

1   Q.   So you remember where we started about an hour ago, sir?

2   I asked you for a breach of FRAND agreement. That's a breach

3   of contract. Correct?

4   A.   I think that's a legal question, but okay.

5   Q.   And I said we need to look to the words of the contract

6   to determine what the contract says. Correct?

7   A.   That's my understanding.

8   Q.   And you and I looked at that RAND promise that TQ Delta

9   made. Correct?

10   A.   Yes, we did.

11   Q.   Nowhere in that contract did it say anything about you

12   can give your friends a pre-paid discount, did it, sir?

13   A.   It absolutely did.

14   Q.   Nowhere in that contract did it say you can give them a

15   pre-payment reduction or discount, did it, sir?

16   A.   It absolutely did.

17   Q.   We can agree, sir, whether you think the 14 cents,

18   whether the math is right or not, that's what ZyXEL paid for

19   non-Lantiq chips that contain VDSL2. Correct?

20   A.   I disagree.

21   Q.   You would agree that charging CommScope $3.20 and having

22   our largest competitor only pay at most 14 cents and for some

23   chips zero is a competitive disadvantage. Correct?

24   A.   I disagree. It's apples and oranges.

25   MR. DACUS: We can take that down, Mr. Carrillo.

1   Q.   (BY MR. DACUS) I'd like to ask you a few questions about

2   this Nokia license if that's okay, sir?

3   A.   Sure.

4   Q.   I guess the first place to start is Nokia sells a

5   different type of equipment and product. Correct?

6   A.   It's DSL equipment.

7   MR. DACUS: Your Honor, I think we need to seal the

8   courtroom to talk about this license, please, sir.

9   THE COURT: All right. Based on counsel's request

10   and to protect confidential information, I'll order the

11   courtroom sealed.

12   I'll direct that all persons present who are not subject

13   to the protective order in this case should excuse themselves

14   and exit the courtroom until it's reopened and unsealed.

15   (Courtroom sealed.)

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18   (Courtroom unsealed.)

19   THE COURT: All right. We're unsealed. You may

20   proceed with redirect examination when you're ready.

21   REDIRECT EXAMINATION

22   BY MR. FINK:

23   Q.   Doctor Putnam, has CommScope taken a license to TQ

24   Delta's patents?

25   A.   No.

1   Q.   And was CommScope approached and offered TQ Delta's

2   standard rates something like nine years ago?

3   A.   Yes.

4   Q.   And have CommScope's competitors that they discussed

5   actually, in fact, taken a license?

6   A.   That's correct.

7   Q.   So is CommScope operating in a competitive advantage

8   right now or a competitive disadvantage?

9   A.   Competitive advantage.

10   Q.   Why is CommScope operating at a competitive advantage

11   towards its competitors right now?

12   A.   Because they haven't actually paid the same royalties as

13   their competitors.

14   Q.   And so is that damage to TQ Delta?

15   A.   It puts TQ Delta at an advantage [sic] both because of

16   delay, as I explained, and also because CommScope is able to

17   take sales from TQ Delta licensees.

18   Q.   So CommScope is effectively also harming its competitors

19   by not taking a license to TQ Delta's patents.

20   A.   That's right.

21   Q.   And, Doctor Putnam, you were asked a lot of questions

22   about use that has been made of TQ Delta's inventions. Is

23   that right?

24   A.   Yes.

25   Q.   And what do you understand use in that statute to be?

1   A.   Well, just to --

2   MR. DACUS: Objection, Your Honor; calls for a legal

3   conclusion.

4   THE COURT: Overruled.

5   THE WITNESS: Well -- and, of course, I don't mean

6   to pronounce upon the law. The actual words of the statute

7   are damages adequate to compensate for infringement, but in no

8   less -- but in no event less than a reasonable royalty for the

9   use made of the invention.

10 Q.   (BY MR. FINK) And do you understand that use can take

11 multiple forms in a patent such as being made or sold or also,

12 in fact, used?

13 A.   Yes. The statute elsewhere explains what the infringing

14 acts are, which could include making or using or selling or

15 offering for sale or importing the device that's accused of

16 infringement.

17 Q.   And so in this case it would be, in part, talking about

18 just simply CommScope's having sold these products regardless

19 of in a sense how they're used in the end?

20 A.   That would be my understanding, yes.

21 Q.   And, Doctor Putnam, do you recall that counsel made a

22 representation about what the statute of limitations was in

23 Europe, I believe related to a Nokia license?

24 A.   Yes.

25 Q.   And I believe you said it was three years. Is that

1   right?

2   A.   That's what he said. I don't know for certain. For

3   myself, I don't know.

4   Q.   So you don't know that the statute of limitations in

5   Europe may actually be 10 years rather than three?

6   A.   My expectation would be it varies from country to

7   country, but it's not something that I've studied for the

8   purposes of a U.S. case.

9   THE COURT: Mr. Fink, I know you have a good strong

10   voice, but either speak up or pull the microphone a little

11   closer to you.

12   MR. FINK: Thank you, Your Honor, but I have no

13   further questions at this point.

14   THE COURT: All right. You pass the witness?

15   MR. FINK: Yes, pass the witness.

16   THE COURT: Is there further cross, Mr. Dacus?

17   MR. DACUS: No, Your Honor. Thank you.

18   THE COURT: All right. You may step down, Doctor

19   Putnam.

20   THE WITNESS: Thank you, Your Honor.

21   THE COURT: You're welcome.

22   Plaintiff, call your next witness.

23   MR. DAVIS: Your Honor, Plaintiff rests.

24   THE COURT: All right. Plaintiff has rested its

25   case in chief, and we'll proceed with the Defendants' case in

1   chief, as I previously discussed with the jury.

2   We are at 15 minutes until noon, however, and the next

3   witness looks like he will certainly take longer than 15

4   minutes, so we're going to break for lunch at this point.

5   Ladies and gentlemen of the jury, if you'll take your

6   notebooks with you to the jury room over the lunch break.

7   Please follow all my instructions, including not to discuss

8   the case with each other. And we'll be back to continue with

9   the Defendants' first witness as a part of their case in chief

10 in approximately 45 minutes to an hour.

11   With that, the jury's excused for lunch.

12   (Whereupon, the jury left the courtroom.)

13   THE COURT: Court stands in recess for lunch.

14   (Lunch recess.)

15   THE COURT: Be seated, please.

16   Mr. Barton, is the Defendant -- are the Defendants

17 prepared to call their first witness?

18   MR. BARTON: We are, Your Honor.

19   THE COURT: Who will your first witness be?

20   MR. BARTON: Ben Miller.

21   THE COURT: All right. Let's bring in the jury,

22 please, Mr. Turner.

23   (Whereupon, the jury entered the courtroom.)

24   THE COURT: Welcome back from lunch, ladies and

25 gentlemen. I hope it was good. Please have a seat.

1   As noted just before we broke for lunch, the Plaintiff

2   has rested their case in chief, and we'll transition to the

3   Defendants' case in chief.

4   Mr. Barton, Defendants should call their first witness.

5   MR. STEVENS: Your Honor, we call Ben Miller.

6   THE COURT: All right. Mr. Miller, if you'll come

7   forward and be sworn by the Courtroom Deputy, please.

8   (Whereupon, the oath was administered by the Clerk.)

9   THE COURT: Please come around, sir, have a seat at

10   the witness stand.

11   Mr. Stevens, you may proceed with direct examination.

12   MR. STEVENS: Thank you, Your Honor.

13   BENJAMIN MILLER, SWORN,

14   having been duly sworn, testified under oath as follows:

15   DIRECT EXAMINATION

16   BY MR. STEVENS:

17   Q.   Good afternoon, Mr. Miller.

18   A.   Good afternoon.

19   Q.   Could you please introduce yourself to the jury?

20   A.   My name is Benjamin Miller.

21   Q.   And, Mr. Miller, for whom do you work?

22   A.   I work for CommScope.

23   Q.   And what is your current title and role at CommScope?

24   A.   My title is principal engineer, and my role is working as

25   a software architect for ethernet LAN and PON-based broadband

1   access devices.

2   Q.   Is it safe to say, Mr. Miller, that one of your roles at

3   CommScope is not to testify in cases?

4   A.   This is not something I do often.

5   Q.   As part of your job, do you support DSL products at

6   CommScope?

7   A.   I do. They are legacy products, but I do support them.

8   Q.   And what do you mean when you say they are legacy

9   products?

10   A.   They refer to products that were developed by companies

11   that have been purchased over the years by CommScope. These

12   are products that are not currently in active development. So

13   Pace or ARRIS products are basically legacy product.

14   Q.   And what legacy products in the DSL space did you work

15   on?

16   A.   I worked on 5268 and the 5168.

17   Q.   And when did you start working on each of those products?

18   A.   The 5168 I believe started in late 2011. And the 5268,

19   I'm a little fuzzier. It's -- it is maybe roughly a year

20   later, maybe a little bit more than that, but it goes pretty

21   far back.

22   Q.   As part of your job responsibilities, do you have any

23   responsibilities relating to the software for CommScope's DSL

24   products?

25   A.   I do. I was -- I wrote virtually all of the software for

1   the management of the DSL interface, which -- which is related

2   to configuration of the modem as well as extracting statistics

3   and other information that's used in the rest of the system,

4   specifically for the DSL interface.

5   THE COURT: Mr. Miller, will you pull the microphone

6   a little bit away from you?

7   THE WITNESS: Too loud?

8   THE COURT: It looks like are about to eat it.

9   THE WITNESS: Sure. Great.

10   THE COURT: Right there is fine.

11   Let's continue.

12   Q.   (BY MR. STEVENS) And as part of that initialization code

13   for the DSL products, does that code turn the R-O-C or ROC

14   feature on or off?

15   A.   It keeps it off.

16   Q.   And could you explain that for us, please?

17   A.   The bit that is associated with the ROC feature is set to

18   zero in our configuration data which means that the feature is

19   off.

20   Q.   And if you wanted to go back and sort of look at the code

21   to find that out, what would you do?

22   A.   I would look -- the first place I would look, the natural

23   place is look, is in Broadcom's DSL driver code. I'm familiar

24   with it. There's a file called softDSL.H, which has controls

25   for various features of the DSL modem, and one of them is the

1   robust overhead channel, or ROC feature. There's a control

2   for it in this file.

3   Q.   And is it a particular bit in this file?

4   A.   There is a definition inside this file that the label is

5   K DSL ROC enabled, and that label is defined to be bit 28 of a

6   32-bit number used for modem configuration.

7   Q.   And what does CommScope do with that bit 28?

8   A.   CommScope's configuration data that we send to the modem

9   sets the value of bit 28 to 0, which leaves the feature off.

10   Q.   And is this true in all of the legacy products, the DSL

11   products?

12   A.   Yes.

13   Q.   And have you ever double-checked to make sure that the

14   ROC feature is off in those products?

15   A.   I did. I checked on a couple of units. One actually

16   happens to be unit in my home. Another one is one I had

17   around the lab. And I can look at the configuration of the

18   DSL modem using software that I wrote for the system, and it

19   was what I expected -- the value is what I expected and saw in

20   the code. And bit 28 of that configuration data of the

21   important element of the configuration data is 0, which means

22   it's off.

23   Q.   And we're talking at the present time. Did you look back

24   to see whether that was different at any point in time in the

25   past?

1   A.   I did.

2   Q.   And what did you find?

3   A.   I found that there were no changes to either the software

4   that I wrote for modem configuration or Broadcom's DSL driver

5   software for the accused products that ever set this bit 28 to

6   a value of 1. So nothing ever enabled it as far as I can

7   tell.

8   Q.   So as far back in time as you can tell, has this ROC

9   feature been off in CommScope's products?

10   A.   Yes. My searching went back to 2012 in the source code

11   repositories.

12   Q.   And at your time at CommScope, has any customer, AT&T or

13   anyone else, ever reached out to you and said, we would like

14   for R-O-C or ROC to be turned on? Has that ever happened?

15   A.   No, not that I'm aware of. It has not happened.

16   Q.   Thank you.

17   MR. STEVENS: Your Honor, I pass the witness.

18   THE COURT: Cross-examination by the Plaintiff?

19   Proceed when you're ready, Mr. McAndrews.

20   CROSS EXAMINATION

21   BY MR. McANDREWS:

22   Q.   Good afternoon, Mr. Miller.

23   A.   Good afternoon.

24   Q.   Nice to see you again.

25   A.   You, too, yeah.

1   Q.   So I've had a chance to take your examination previously.

2   Correct?

3   A.   Yes.

4   Q.   And I think you told me that, consistent with what you

5   said here, is that there were times at which you were the

6   person that was most knowledgeable of the DSL standards and

7   their implementation in -- in the CommScope products. Is that

8   correct?

9   A.   Of the standards? I don't remember saying I was most

10   knowledgeable of the standards.

11   Q.   Most knowledgeable of the DSL features of the accused

12   products?

13   A.   Yes.

14   Q.   Okay. So there was a time in which you were -- you held

15   that title, I guess, for CommScope.

16   A.   Yes, I would agree with that.

17   Q.   Okay. I want to ask you something, first of all, about

18   what you just said about this bit 28.

19   A.   Yes.

20   Q.   So let me ask you something. The bit that would be

21   set -- and this is not bit 28, perhaps, but the bit that would

22   be set for dynamic D -- are you familiar with the dynamic D

23   feature?

24   A.   I've heard of dynamic D.

25   Q.   Okay. You didn't provide any testimony about dynamic D,

1   did you?

2   A.   I did not.

3   Q.   If jury didn't hear that the dynamic D, which is dynamic

4   change of interleaver depth, the jury didn't hear you say that

5   the products are not capable of doing dynamic D. Is that

6   correct?

7   A.   That is correct. I did not say that.

8   Q.   Okay. So this bit 28 that apparently you can read

9   somehow through a software interface. Correct?

10   A.   Yes.

11   Q.   Okay. Is it possible that bit could be changed?

12   A.   It's -- it's -- not by us. Not by our code.

13   Q.   Not by your code. But let me ask you this. If dynamic D

14   was -- I'm sorry. If R-O-C was operating on the product,

15   would the bit that you see, bit 28, would it change?

16   A.   I mean, I really don't know. All I can say is that when

17   we configure the bit, when we send the bits to configure the

18   modem, which is the customer's right to do, we do not enable

19   the R-O-C -- K DSL ROC-enabled related bit 28.

20   Q.   Do you understand how the ROC standard works?

21   A.   No.

22   Q.   You don't. Do you understand that if the CO, the central

23   office transceiver, tells the CPE to implement ROC, then

24   ROC -- that that's the way that it gets enabled? Do you

25   understand that?

1   A.   No, I -- I don't -- I don't agree with that.

2   Q.   I thought you just said you weren't familiar with the

3   standard.

4   A.   Well, the thing is, it's -- it's not that I'm not

5   familiar with the standard, but we have the ability to turn

6   off features that are part of the standard.

7   Q.   Right. And in the standard, the CO has the ability to

8   turn them on. Correct?

9   A.   Not everything. They can't -- they can't necessarily

10   turn on features that we choose to keep off.

11   Q.   Okay. Let me ask you this.

12   A.   And that depends -- this depends -- this is Broadcom

13   implementation. But there are definitely cases where we can

14   turn off features, make -- make sure they're not advertised as

15   supportable.

16   Q.   Now, are you familiar with the G.INP standard?

17   A.   I am.

18   Q.   Do you understand that when the -- let me ask you this.

19   So all of the accused products in the case are capable of

20   operating with the G.INP standard working. Correct?

21   A.   As far as I know, yes.

22   Q.   Okay. And when the G.INP standard is working, the ROC is

23   automatically turned on. Did you know that?

24   A.   I don't know about this.

25   Q.   So despite the fact that you are the most knowledgeable

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 1    about the DSL feature of the products --

 2    A.    Uh-huh.

 3    Q.    -- you're not familiar with that aspect of the standard.

 4    A.    I'm not -- I'm not familiar with that -- I'm not familiar

 5    with that aspect of standard, that's correct.

 6              THE COURT:  Let me ask two things.  Let me ask both

 7    of you to talk more slowly and let me ask both of you to pause

 8    before either answering the next question or asking the next

 9    question.  You're just about to start talking over each other.

10         So let's build a little separation into this exchange,

11    and let's talk more slowly.

12              THE WITNESS:  Yes, Your Honor.

13              THE COURT:  All right.  Let's proceed.

14              MR. McANDREWS:  Yes, Your Honor.

15    Q.    (BY MR. McANDREWS)  So you don't have any idea whether,

16    when G.INP is enabled in the product, whether the ROC must be

17    enabled?

18    A.    No, I don't.

19    Q.    Okay.  And you don't know whether bit 28 would change if

20    G.INP was active.  Correct?

21    A.    It would not change in our configuration data or in the

22    data maintained by Broadcom's DSL driver.  That much I know.

23    Q.    Okay.  But bit 28 in that instance, assuming what I'm

24    saying is true, and that is that G.INP will automatically

25    enable the ROC, you don't know whether -- whether you could
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1   observe whether the ROC is on based on bit 28. Correct?

2   A.   I -- there -- there may be ways to observe it. So I

3   can't say -- I -- I mean, I can't say it's unobservable

4   whether ROC is on or not.

5   Q.   Okay. So you're not -- you're not here today to say that

6   the accused products will not have ROC enabled when they

7   operate using G.INP. Correct?

8   A.   I'm only here to say that we don't -- we don't configure

9   the ROC feature as Broadcom has given us controls to do.

10 Q.   Right. And that's the ROC feature that is independent

11 from the G.INP ROC feature that is required by that standard.

12 Correct?

13 A.   I don't know actually. I can't speak to whether it is or

14 isn't.

15 Q.   Okay.

16 A.   I don't know for sure, and I can't say one way or the

17 other whether or not the control that we turn off actually

18 does control within Broadcom's black box DSP modem 5 firmware,

19 whether or not it disables the ROC functionality for all

20 cases. I don't know. It might, it might not.

21 Q.   And you're calling it a black box because you don't know

22 how the Broadcom chip actually works.

23 A.   Exactly. We have no access to their -- their 5 modem DSP

24 firmware, yes.

25 Q.   Okay.

1   MR. McANDREWS: Pass the witness, Your Honor.

2   THE COURT: Additional direct?

3   MR. STEVENS: No, Your Honor.

4   THE COURT: You may step down, Mr. Miller.

5   THE WITNESS: Thank you.

6   THE COURT: You're welcome.

7   Any reason this witness should not be excused?

8   MR. STEVENS: None that I see, Your Honor.

9   THE COURT: Mr. Miller, you're excused, which means

10 you're free to leave, you're also free to stay. It's up to

11 you.

12   THE WITNESS: Thank you, Your Honor.

13   THE COURT: You're welcome.

14   Call your next witness, Defendants.

15   MR. STEVENS: Your Honor, Defendants call

16 Dr. Leonard Cimini via trial deposition.

17   THE COURT: All right. If you will introduce the

18 witness, and then we'll proceed with his testimony by

19 deposition.

20   MR. STEVENS: Doctor Cimini has been accepted by the

21 Court as an expert in the fields of telecommunications,

22 multicarrier telecommunications, and the asserted patents, and

23 he will be testifying regarding the '686 and '008 Patents.

24   Your Honor, the times are for CommScope, 47 minutes and 3

25 seconds, and for TQ Delta, 25 minutes and 37 seconds.

1   THE COURT: All right. Please proceed with this

2   witness by deposition.

3   LEONARD CIMINI, Ph.D., BY SWORN DEPOSITION,

4   Q.   Good morning, Doctor Cimini. Can you please introduce

5   yourself to the jury?

6   A.   My name is Leonard Cimini. I am a professor at the

7   University of Delaware. I've been there since 2002. Twenty

8   years before that, I was with AT&T.

9   Q.   And do you understand, sir, that your testimony today

10   will be presented to the jury in Marshall, Texas?

11   A.   Yes.

12   Q.   And can you tell us why you're unable to be with us live

13   in Marshall, Texas?

14   A.   I have some serious medical illnesses related to my

15   lumbar spine, my lower back, and they prevent me from

16   traveling and making very difficult. Of course, I'd rather be

17   testifying in person.

18   Q.   Thank you, sir.

19   Have you prepared a series of demonstratives to

20   illustrate your testimony here today?

21   A.   Yes, I have.

22   Q.   So I'd like to show on the screen here DDX 1.2.

23   Doctor Cimini, can you walk us through your educational

24   background, please.

25   A.   I received a Bachelor of Science in 1978 in electrical

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 1    engineering from the University of Pennsylvania.  One year

 2    later, I received a Master's degree from Penn and then in 1982

 3    a Ph.D. also from Penn.  I spent the full of 1979 at MIT.

 4    Q.    And after graduation, what was the first job you held?

 5    A.    In April of 1982, I joined AT&T Bell Laboratories in a

 6    group working on the first cellular system in the United

 7    States.  We would now call that 1G.  My particular assignment

 8    was to work on 2G.  And, in particular, that's where I first

 9    worked on multicarrier modulation.

10    Q.    And what did you do after that?

11    A.    A few years after that, I moved to the research area in

12    Bell Laboratories, and I worked on fiberoptics communications

13    and wireless communications, specifically next generations for

14    WiFi and cellular.

15    Q.    And while you were working on telecommunications at AT&T,

16    did you interact with the DSL team?

17    A.    The research area at Bell Labs, at that time you did your

18    own research, plus you acted as a consultant to the rest of

19    AT&T, were advisors to the rest of AT&T.

20          And the DSL community within AT&T often came to the

21    research area to ask for some advice, tell us what they were

22    doing, answer some questions especially because I had a

23    background in multicarrier modulation.

24    Q.    And the research that you were doing, how is that

25    research relevant to some of the things that we find in DSL?
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1   A.   Well, in particular, first it was on multicarrier

2   modulation. That I worked on from 1982 through today, and I

3   also worked on techniques for reducing the peak-to-average

4   power ratio using -- particularly using phase scrambling.

5   Q.   And, sir, what did you do after you left AT&T and what do

6   you do today?

7   A.   I -- in 2002, I left AT&T and I joined the University of

8   Delaware and I've been there ever since.

9   Q.   Sir, are you a named inventor on any United States

10   patents?

11   A.   Yes. I have 29 patents.

12   Q.   And those patents, do they include subject matter that's

13   relevant to your testimony here today?

14   A.   Yes. Several of the patents, of course, would be for

15   multicarrier modulation and especially with respect to

16   reducing the peak-to-average power ratio using some sort of

17   phase scrambling.

18   Q.   Are you the author of any scientific or industry

19   publications?

20   A.   Yes. More than 190. And a large number of those are in

21   multicarrier modulation, a large peak-to-average power ratio

22   and techniques for reducing it, especially using phase

23   scrambling.

24   Q.   Thank you, sir.

25   At this time I would move that Doctor Cimini be admitted

1   as an expert in the field of telecommunications, multicarrier

2   communications, and the subject matter of the asserted

3   patents.

4   MR. McANDREWS: No objection.

5   Q.   So, sir, let me show you slide 3. What do we see here on

6   the screen, both the left and the right side?

7   A.   On the left side is my definition -- CommScope's

8   definition, and on the right is TQ Delta's definition.

9   Q.   And definition of what, sir?

10   A.   A person of ordinary skill in the art. And our

11   definition is five years' experience with a Bachelor's degree.

12   And then if you have a higher level of education, you need

13   less years of experience. TQ Delta's is less restrictive.

14   It's three years' experience and a Bachelor's degree.

15   Q.   And, sir, regardless of which of these two the jury

16   ultimately adopts, did you meet the definition? In other

17   words, did you have the level of skill in the art as shown

18   here under either definition back in 1999?

19   A.   Yes. Under either definition.

20   Q.   And, sir, have you had the opportunity in this case to

21   review the claim constructions that the Judge has provided to

22   us and did you apply those in your analysis?

23   A.   Yes, I have.

24   Q.   So we'll walk through this in detail. But looking at

25   slide 4, can you give us an overview of the opinions that

1   we're going to discuss here today?

2   A.   Based on the materials that I studied, the claim elements

3   in the '686 Patent and the '008 Patent were already known and

4   old concepts before the application of these patents, so the

5   patents are invalid.

6   Q.   Thank you, sir.

7   Before we get to that, I'd like to look here at slide 5.

8   What do we see on this screen?

9   A.   On the left is one of -- is a DSL -- the accused product.

10   It's a DSL device. In the middle is a board from inside that

11   device. And on the right is a Broadcom chipset that basically

12   sits in the middle of the board.

13   Q.   Now, for the '686 Patent, which I expect by this point in

14   time in the trial TQ Delta's experts have identified something

15   called loop diagnostic mode, what component did TQ Delta's

16   experts point to with respect to the alleged loop diagnostic

17   mode functionality?

18   A.   The Broadcom chipset.

19   Q.   And in doing that, did TQ Delta's experts ever refer to

20   the CommScope source code as opposed to the Broadcom source

21   code for that functionality?

22   A.   They never -- they never referred to the CommScope source

23   code.

24   Q.   And in the reports that you've seen from TQ Delta's

25   experts, beyond the transceiver on the Broadcom chipset, did

1   TQ Delta's experts in their reports ever refer to or identify

2   any other hardware other than the Broadcom chipset that could

3   possibly be relevant to loop diagnostic mode?

4   A.   No, they did not.

5   Q.   So I'm going to ask you the same questions for the other

6   patent, the '008 Patent. And by now, I suspect that TQ

7   Delta's experts have talked about phase scrambling.

8   So in their reports, did TQ Delta's experts -- what

9   component did TQ Delta's experts point to as relevant to the

10   alleged phase scrambling?

11   A.   The Broadcom chipset.

12   Q.   And in their reports, did TQ Delta's experts ever refer

13   to the CommScope source code as opposed to the Broadcom source

14   code with anything with respect to phase scrambling?

15   A.   No, they did not.

16   Q.   And then, finally, besides the transceiver on the

17   Broadcom chipset, in their reports did TQ Delta's experts ever

18   refer to any other piece of hardware as relevant to the phase

19   scrambling functionality?

20   A.   No, they did not.

21   Q.   So let's turn now to the first patent, the '686 Patent.

22   When did Aware first go to the Patent Office with its

23   application mentioning idle channel noise?

24   And for reference I've got slide No. 6 here on the screen

25   showing the '686 Patent.

1   A.   As you can see on the slide, it's August 10th, 2000.

2   Q.   Okay. I see another date a little bit lower of January

3   7th, 2000. Why did you not identify that date?

4   A.   The '865 provisional application did not include idle

5   channel noise.

6   Q.   Okay. So, again, when was the first time that Aware

7   actually went to the Patent Office with an application that

8   identified idle channel noise as being relevant?

9   A.   In August of 2000.

10   Q.   And what's the relevance of this date? What's the

11   relevance to your analysis of this August 10, 2000 date?

12   A.   This -- anything before this date would be considered old

13   or known technology.

14   Q.   Okay. And is the '686 Patent, is it still in force today

15   or has it expired as we all sit here today?

16   A.   It expired.

17   Q.   The claims that the jury has heard about by now mention a

18   specific test, a test for idle channel noise. What is that?

19   A.   Idle channel noise is measurement where you turn the

20   signal off, and so that's the idle channel part, and what you

21   measure is just the noise levels.

22   Q.   And, Doctor Cimini, that concept of measuring just the

23   noise when the -- when the signal is off, is that an old

24   concept or is that something that Aware invented?

25   A.   No, that concept of measuring the noise when the signal

1   is off is an old and well-known concept.

2   Q.   So I'd like to -- if you could look at slide 7 here,

3   could you tell us, back in 1996, were there standards that

4   talked about using or doing an idle channel noise test?

5   A.   Yes.   This is the ITU standard from November of 1996.

6   It's labeled as G.712, and you can see there's a section 9

7   that talks about idle channel noise.

8   Q.   And so can there be any question whether Aware invented

9   the test for idle channel noise or did other companies know

10   that years before they ever went to the Patent Office?

11   A.   No, this was already well-known and used years before

12   that.

13   Q.   If we look at slide 8 here, which brings up Exhibit 48,

14   can you tell us what we're looking here in Exhibit 48?   What

15   is this?

16   A.   This is the ADSL standard document, and it was published

17   in June of 1999.

18   Q.   Now, again, is this an Aware or a TQ Delta-specific

19   document or is this a document that all the different

20   companies had put together and voted on?

21   A.   No, this is a document that is put together and agreed

22   upon by all of the companies participating in the ITU.

23   Q.   Now, when the examiner was looking at the Aware patent,

24   the application that ultimately became the '686 patent, did

25   the examiner review this particular document as part of his

1   work?

2   A.   The patent examiner does not cite this ADSL standard on

3   the references cited on the front of the patent.

4   Q.   And you just mentioned the references cited. How does

5   one know whether the examiner actually reviewed a document and

6   checked it off? How do we know so many years later?

7   A.   He includes them in the list on the front pages or the

8   front pages of the patent.

9   Q.   Thank you.

10   Now, again, we looked at a date in 2000. So this

11   document that we're looking at on the screen, Exhibit 48, the

12   ADSL standard, was that before Aware ever went to the Patent

13   Office with this application?

14   A.   Yes. This is June 1999, which is before the August 2000

15   date.

16   Q.   So if we look at slide 9 here, which shows a little bit

17   more about the ADSL standard, what does it tell us about the

18   concept of a message that only has one bit of information per

19   symbol?

20   A.   So this is a table out of the ADSL standard that we just

21   saw, and it talks about particular messages, in this case the

22   receive rates message, that uses one -- only one bit of

23   information in each symbol.

24   Q.   So, again, is the concept of using one bit of information

25   per symbol, is that something Aware invented or is that

1   something that other companies had published before Aware ever

2   went to the Patent Office?

3   A.   No. As we can see here, this is already showing using

4   one bit per symbol, and this was in the ADSL document from

5   1999.

6   Q.   And, sir, I'd like to direct your attention now to slide

7   10, which actually shows the '686 Patent, the actual Aware,

8   now TQ Delta, patent.

9   What does it tell us about whether Aware invented a

10   message with one bit per symbol or if that type of message was

11   already known?

12   A.   So in the -- in the patent, in the specification of the

13   patent, they talk about using one bit per DMT symbol in the C

14   rates message. So they're referring to the already existing

15   ITU ADSL standard.

16   Q.   Now, sir, if we look at slide 11 which shows us Exhibit

17   47, were other companies -- before Aware ever went to the

18   Patent Office, were other companies already coming up with

19   improvements or other ideas for the ADSL standard?

20   A.   Yes. This shows a study group within the ITU, and a

21   meeting that they had in Fiji in late January, early February

22   of 2000. And this is a contribution by Tom Starr, who was

23   working at Ameritech SBC, which is now AT&T. And this is a

24   contribution that includes information that they want to add

25   to the diagnostic messages.

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1    Q.    And, sir, I know that you said this was from AT&T, but I

2    want to be entirely clear about one thing.  Does this document

3    have anything to do with Aware or TQ Delta or Mr. Tzannes?

4    A.    No.  This has nothing to do with Mr. Tzannes or Aware.

5    Q.    And this particular document, this AT&T contribution, did

6    the examiner review this document at the PTO when he was

7    assessing Aware's application?

8    A.    No, he did not.

9    Q.    So if we look at slide 12, which shows us the abstract

10   from Exhibit 47, the AT&T contribution, what is this

11   contribution telling us?

12   A.    So we can see in the abstract right at the top that the

13   paper -- that the contribution wants to propose adding

14   diagnostic information to G.992.1, which is ADSL, and in

15   particular it wants to add quiet line power spectral density

16   measurement, which is PSD, and a line balance measurement.

17   Q.    And so when we see the reference here to G.992, is that a

18   reference to the same ADSL standard that we just reviewed a

19   moment ago?

20   A.    Yes.

21   Q.    So do these two documents tie themselves together?

22   A.    Yes.  This is just an improvement, a suggested

23   improvement to the existing standard.

24   Q.    Now, if we look at slide 13, which continues along with

25   AT&T's contribution, what else did AT&T tell the world before
```

1   Aware ever went to the Patent Office?

2   A.   Specifically, here they're suggesting to -- that this

3   diagnostic information is at both ends of the line, so it's at

4   the far end and the near end, and it's communicated over the

5   loop, and that what they're trying to add is a -- what they're

6   suggesting that you add is a quiet line power spectral density

7   measurement.

8   Q.   And so does this disclose testing for quiet line -- I'm

9   sorry, idle channel noise or quiet line noise like the Aware

10   patent did at a later point in time?

11   A.   Yes. The quiet line measurement is an idle channel

12   measurement.

13   Q.   Doctor Cimini, was this document from AT&T, was this

14   document available to all those in the DSL art at the time?

15   A.   It was available to all of those who were interested in

16   DSL at the time.

17   Q.   So, sir, I suspect in a few days when TQ Delta's experts

18   take the stand again, they're going to try to convince the

19   jury that this document wasn't public. Do you agree with that

20   or disagree with that?

21   A.   I don't agree with that.

22   Q.   And can you tell me why, please?

23   A.   Because in the ITU, when you make a contribution, that

24   contribution is immediately available to all of those who are

25   working in the ITU on DSL, for example.

1   And here's a -- on the next slide, you can see

2   there's -- Mr. Starr's on the agenda and his document 071.

3   That's the FI-071 which we're now calling the AT&T

4   contribution. And on the right in the yellow is the

5   contribution, and you would be able to click on that and the

6   contribution would appear and you could read it and it was

7   discussed at this meeting. And I think it was also approved

8   at this meeting.

9   Q.   So we see here on slide 14, so before the meeting

10   happened and people received the agenda, was it possible to

11   click on that link on the right and get this AT&T document?

12   A.   Yes. What you can normally do at a -- at a standards

13   meeting is you send all your contributions in and people can

14   look at them ahead of time. And then the meeting occurs, in

15   this case for a week at the end of January in 2000.

16   Q.   And, sir, looking at slide 15, is the ITU a small

17   organization of just a few people or is it a big organization?

18   A.   The ITU is very large. And as you can see here, there's

19   more than 900 organizations involved, and more than 20,000

20   professionals are involved.

21   Q.   And so when AT&T made this contribution, was it -- was it

22   somehow secret or could every member of the ITU have access to

23   it at that time?

24   A.   It was not secret because anyone who was a member of ITU,

25   especially the people who were interested in DSL, would have

1   had access to this.

2   Q.   Now, sir, again, I suspect when TQ Delta's experts take

3   the stand, they're going to point out that you had to have a

4   password to get behind or to get into the ITU website. Does

5   that mean that everything was confidential at the ITU?

6   A.   No. I have subscriptions to many newspapers, journals,

7   magazines that I pay for, but that information I consider

8   public.

9   Q.   If you look at slide 16 -- have you ever heard of the

10   *Dallas Morning News*, sir?

11   A.   Yes.

12   Q.   And so if you go click through a couple of articles, you

13   might get a couple for free, but this is the screen that's

14   going to arrive. Just because I have to pay a dollar to get a

15   subscription, does that mean that the *Dallas Morning News* is

16   somehow not public?

17   A.   No. We've always paid subscriptions for newspapers or

18   paid to get newspapers. That's public information.

19   Q.   So let me just ask you, again, what is your opinion

20   regarding whether a newspaper is public or private just

21   because you have to pay to get it?

22   A.   Right. That's what I was saying is the newspaper you pay

23   for, or some of the magazines I read, you pay for, but that I

24   consider that public information.

25   Q.   Now, sir, let's look at slide 17. I'd like to walk

1   through the actual claim language of claim 36 of the '686

2   Patent with you. Is that okay, sir?

3   A.   Yes.

4   Q.   And if we look at the first part that we have highlighted

5   here on slide 17, I'm going to read it for you. It says, "An

6   information storage media comprising instructions that, when

7   executed, communicate diagnostic information over a

8   communication channel using multicarrier modulation

9   comprising."

10   Sir, was this a new invention from Aware or is this old

11   technology? Was it already known by others in the art before

12   Aware went to the Patent Office?

13   A.   No, this was old and well-known and well-established

14   technology.

15   Q.   And if we look at slide 18, what did the ADSL standard

16   Exhibit 48 tell us before Aware went to the Patent Office?

17   A.   You can see on this slide, it indicates the ADSL has

18   memory and memory is what an information storage media is.

19   Memory is in your DSL device, it's in your cell phones,

20   it's -- when you use WiFi. Any time you're storing data,

21   instructions, you need memory.

22   Q.   If we look at slide 19, the next part of the claim talks

23   about instructions. What did the AT&T contribution tell us

24   about these instructions?

25   A.   So in the FI-071, the AT&T contribution, you can see

1   where they are suggesting that you perform these diagnostic

2   tests and they're going to be performed at either end of the

3   subscriber line. And what they're trying to do is come up

4   with this diagnostic information, so you're -- over the

5   communication channel.

6   Q.   Did ADSL use multicarrier modulation, sir?

7   A.   Yes. As you can see on the right, this is taken from the

8   ADSL standard. On the right, you can see it's talking about

9   discrete multitone sub-carrier. Discrete multitone is the

10   form of multicarrier modulation that's used in DSL.

11   Q.   And did this ADSL standard disclose multicarrier

12   modulation before Aware ever went to the Patent Office?

13   A.   Yes. The ADSL standard was in 1999.

14   Q.   So, sir, if we look again at that first language of claim

15   36, was that old technology, was it already known by others,

16   or is that something that Aware invented?

17   A.   That's something that was old and well-known, and Aware

18   did not invent it.

19   Q.   Now, if we look at slide 22, let's talk about the next

20   portion of the claim. It says, instructions that, when

21   executed, direct a transceiver to receive or transmit an

22   initiate diagnostic mode message.

23   Again, is that something Aware invented or did others

24   such as AT&T already know that and talk about it first?

25   A.   No. We can find that in that AT&T contribution FI-071.

1   Q.   So if we look at slide 23, which shows that AT&T

2   contribution, tell me how that the AT&T contribution shows

3   that.

4   A.   So you can see in the highlighted text that, upon request

5   of a management entity, so that's the instructions that are

6   starting this diagnostic mode. And then what follows, it's

7   telling you that you should turn off the signal that's putting

8   it into quiet mode. And then you're going to measure the

9   quiet power spectral density.

10   Q.   Thank you, sir.

11   And so looking at slide 24, again, did companies like

12   AT&T already disclose this -- these instructions before Aware

13   ever went to the Patent Office?

14   A.   Yes. This was already disclosed in, for example, FI-071.

15   Q.   Now, looking at slide 25, I'm going to break this last

16   paragraph up in the claim because it's a little bit long.

17   It reads, "Instructions that, when executed, transmit

18   from the transceiver a diagnostic message using multicarrier

19   modulation with DMT symbols that are mapped to one bit of the

20   diagnostic message."

21   Is that something Aware invented or had others already

22   disclosed that before Aware went to the Patent Office?

23   A.   No. Again, this is old and known concepts.

24   Q.   And if we look at slide 26, what did ADSL tell us about

25   whether there were messages with one bit per symbol?

1   A.   So here's the same table we used before from the ADSL

2   standard, and it's talking about the C-rates message. And you

3   can see clearly here that only one bit of information is

4   transmitted in each symbol.

5   Q.   And what did the inventors say? What did Mr. Pizzano say

6   about whether this messaging scheme with one bit per symbol

7   was their idea or whether they copied that from an earlier

8   standard?

9   A.   So Mr. Pizzano was asked very clearly was that concept

10   known in the standard prior to his invention? And he answered

11   that it was part of the ITU standard, that they used one bit

12   per symbol messaging. And then they asked again, was it

13   pulled from the ITU standard? And he said, yes, we simply

14   reused existing standardized symbols.

15   Q.   And so looking at slide 28, again this limitation about

16   instructions that when executed, was that old technology that

17   others had already disclosed or is that something that Aware

18   invented?

19   A.   That was already disclosed before the Aware application.

20   Q.   So looking at slide 29, I've now highlighted the middle

21   part of the claim -- the bottom part of the claim where it

22   says, "Wherein the diagnostic message comprises a plurality of

23   data variables representing the diagnostic information about

24   the communication channel."

25   And plurality, I believe just means two or more. Is this

1   a concept that Aware invented or is this also known to others

2   like AT&T before?

3   A.   We can also find this in the FI-071 AT&T contribution.

4   So it was known before Aware's application.

5   Q.   And if we look at slide 30, walk us through that in the

6   Aware contribution, please.

7   A.   So this is the AT&T contribution the FI-071 again, and it

8   summarizes the diagnostic information that it's suggesting you

9   send. And first is there's five variables here, and so

10   there's definitely a plurality of variables.

11   The first one is upstream signal-to-noise ratio margin,

12   the upstream attenuation, the downstream power control of the

13   ATU-C, and then a quiet line power spectral density unit and a

14   line balance measurement.

15   Q.   And so, sir, is that a plurality of data variables?

16   A.   Yes, it is a plurality.

17   Q.   So if we look at slide 31, again the highlighted

18   language, was this already disclosed by companies like AT&T

19   before Aware?

20   A.   Yes, this was disclosed before Aware.

21   Q.   And if we look at slide 32, the very bottom of the claim,

22   it says, "Wherein one variable comprises an array representing

23   is frequency domain received idle channel noise information."

24   Is that something Aware invented or is that disclosed by

25   other companies earlier in time?

1   A.   This was disclosed in the past before the Aware

2   application.

3   Q.   And if we look at slide 33, what did the AT&T

4   contribution tell us about this?

5   A.   So you can see from the FI-071 that it's suggesting that

6   you add this quiet line power spectral density measurement, so

7   the quiet line means that the signal is turned off. That's

8   the idle channel noise portion. And the power spectral

9   density is a measure of the power as a function of the

10   frequency. So you would make that measurement at multiple

11   locations -- multiple frequencies, and that would create the

12   array.

13   Q.   And is that all disclosed by AT&T before Aware?

14   A.   Yes. It's all disclosed in the FI-071.

15   Q.   And did one of the inventors testify about whether Aware

16   invented idle channel noise testing or whether it was older?

17   A.   Yes, he did.

18   Q.   And if we look at slide 34, what did one of the

19   inventors, Doctor Krinsky, tell us about that?

20   A.   So Doctor Krinsky was asked again very directly, did you

21   invent the concept of idle channel noise information testing?

22   And he answered, probably not.

23   Q.   So, sir, if we look at slide 35, did Aware invent any of

24   these concepts or was everything that we see in claim 36

25   already old technology that other companies had already

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 1    disclosed?

 2    A.    All of the claim elements in claim 36 of the '686 Patent

 3    were old and well-known technology before -- long before the

 4    Aware application.

 5    Q.    And so in your professional opinion, is claim 36 directed

 6    to old and thus invalid technology or was it directed to new

 7    and not invalid technology?

 8    A.    Claim 36 was old and well-known technology and is not

 9    valid.

10    Q.    And, again, when you walked through the ADSL and the

11    FI-071 AT&T contribution, did the Patent Office have the

12    benefit of looking at either of those documents when it was

13    assessing claim 36?

14    A.    No, they did not.

15    Q.    Thank you.

16          So, sir, I'd like to now turn our discussion to the other

17    patent, the '008 Patent.  Is that all right, sir?

18    A.    Yes.

19    Q.    And by now, I suspect the jury has heard the concept of

20    peak-to-average power ratio, sometimes called PAR.  So what is

21    PAR?

22    A.    So the peak-to-average power ration is the ratio of the

23    peak power to the average power.  And the peak power simply

24    means the largest value that comes out in a signal.  And when

25    it's very large compared to the average, it can cause
```

1   significant problems in multicarrier signals.

2   Q.   Is that issue unique to DSL or does that appear in other

3   multicarrier telecommunication systems?

4   A.   No.   It would apply to all multicarrier -- multicarrier

5   modulation communication systems because the peak-to-average

6   power ratio is a problem in all of them.

7   Q.   And, sir, did you yourself, did your own research, look

8   into solving this PAR problem as early as the '80s?

9   A.   Yes.   I was working on multicarrier modulation for

10   cellular-type communication and WiFi-type communication, and

11   both of those the peak-to-average needs to be lower than what

12   it was.   So I needed to work on techniques for reducing this

13   peak-to-average and, in particular, I used phase scrambling

14   techniques.

15   Q.   And so was the concept of using phase scrambling

16   techniques to lower PAR, was that well-known before 1999?

17   A.   Yeah.   I think it was well known for almost as long as

18   multicarrier has been used.

19   Q.   And how far back does multicarrier telecommunications go?

20   A.   Multicarrier goes back a really long time.   The military

21   used it in the late '50s for communications, and commercial

22   development started more in the '80s.

23   Q.   So, sir, let's look at slide 36.   What this

24   graphic -- can you describe again to us what PAR means?

25   A.   So this is an analogy in a, say, a football stadium where

1   on the left you have everybody cheering together at the same

2   time in unison, saying, Cowboys, for example. And what would

3   happen is it would sound very loud, you would have peaks in

4   the value. All right?

5   On the right side, you have all the teams, people

6   cheering their own team's name, they're all doing it out of

7   sync, and so what you get is a low peak. Right?

8   And that's what happens in the communication system.

9   What you have is you have potentially lots of symbols that are

10   the same or redundant, and so they add up together and you get

11   this large peak, while if I could randomize those, I would get

12   a lower peak.

13   Q.   And so how in telecommunications do we solve this problem

14   that we see on the left with this big peak?

15   A.   So one technique is to use phase scrambling. So you take

16   the redundant symbols or the people speaking, and you sort of

17   randomize, for example, when they speak. And then they would

18   not add up all together at the same time.

19   Q.   Now, the first time I heard this, I thought to myself,

20   okay, if you randomize it at the transmitter, how is the

21   receiver ever going to know what it's getting? And how does

22   the receiver know?

23   A.   So what would happen is in order to do this scrambling,

24   you generate a pattern, a random pattern that's also known at

25   the receiver. And then the receiver simply undoes what was

1   done at the transmitter.

2   Q.   And, again, everything that we've just discussed, a PAR

3   problem, phase scrambling, randomizing it, knowing it at the

4   receiver, was that old long before 1999?

5   A.   All of that technology was well-known and around before

6   the Aware application.

7   Q.   Okay. So let me deal with counsel's objection.

8   In the concept of reducing PAR using phase scrambling,

9   what part of that did Aware invent as opposed to other

10   companies?

11   A.   Reducing the peak-to-average by doing some former phase

12   scrambling is an old and well-established concept and

13   well-studied concept, especially in the late '80s and

14   early '90s.

15   Q.   And, sir, were you yourself doing research about that in

16   the late '80s and early '90s?

17   A.   Yes. I was working on reducing the peak-to-average power

18   ratio using several different techniques that were phase

19   scrambling and variations of phase scrambling.

20   Q.   So, sir, if we look now at slide 37, which shows us the

21   '008 Patent, when did Aware first go to the Patent Office with

22   its application?

23   A.   As you can see on the right, November 9th, 1999.

24   Q.   And, again, what is the importance of that date with

25   respect to your analysis?

1   A.   So anything before that date is old, well-known,

2   established technology.

3   Q.   Now, sir, when you were doing research, did you ever come

4   across work from a gentleman by the name of Vincent Jones?

5   A.   Yes. Back at -- in the -- through the '90s, for example,

6   I was working on this peak-to-average problem, I -- and

7   multicarrier modulation, and I tried to read everything

8   or -- that I could find in the journals and the conferences.

9   So I came across this somehow that way. I don't remember

10   exactly. But I -- I was aware of this work back at that time.

11   Q.   And did Mr. Jones work for a company called Cisco?

12   A.   Yes.

13   Q.   Now, we'll talk about the Jones patent here in just a

14   minute. But when the examiner at the Patent Office was

15   looking at Aware's application that led to the '008 Patent,

16   did that examiner have the benefit of the Jones patent?

17   A.   He did not use this -- this patent, the Jones patent.

18   It's not referenced on the list of cited references on the

19   front page.

20   Q.   So I'll just ask that another way. In the examiner's

21   listing of the materials that he considered, is the Jones

22   patent part of that?

23   A.   No.

24   Q.   Now, if we look in your binder, sir, on Exhibit 4, which

25   is the '008 Patent, and we -- we look at the second page of

1 it, we see a list of patents. Is the Jones patent in there?

2 A.   No, it is not.

3 Q.   And I notice down sort of down near the bottom, there's a

4 patent from a gentleman named Cimini. Do you know that guy?

5 A.   Yeah, that's one of my patents.

6 Q.   So you were published in this field before Aware ever

7 went to the Patent Office?

8 A.   Yes, I was.

9 Q.   Okay. So I'd like to look back on the screen here at

10 slide 38, and we see the Jones reference on the left. This is

11 Exhibit 50.

12   Was the Jones reference by Mr. Jones and Cisco, was that

13 before Aware went to the Patent Office.

14 A.   Yeah. The patent was filed July 6, 1999, which is four

15 months before the Aware -- the '008 Patent.

16 Q.   And let me pause because I meant to ask you one question

17 and I skipped it. The '008 Patent, one of the patents that

18 we're here to talk about today, is that still in force or has

19 that expired?

20 A.   That has expired.

21 Q.   Thank you, sir.

22   Okay. So looking again here at the Jones patent, and I

23 want to look at slide 39, which shows Exhibit 50, at column 5,

24 lines 44 through 59. What does the Jones patent tell us about

25 peak-to-mean power ratio?

```
 1    A.    So the peak-to-mean power ratio in the Jones patent is

 2    the same as the peak-to-average power ratio.  The mean and the

 3    average are the same thing.

 4    Q.    And so was the Jones patent directed to this PAR problem?

 5    A.    Yes.  He's talking about reducing the peak-to-average or,

 6    in his case, the peak-to-mean power ratio.

 7    Q.    And does the Jones patent disclose phase scrambling?

 8    A.    Yes, it does.

 9    Q.    Sir, I'd like to walk through the claim with you and get

10    your opinion as to whether this was old technology.  Is that

11    fair, sir?

12    A.    Yes.

13    Q.    Okay.  So if we look at slide 41, the beginning of the

14    claim says, "A multicarrier system including a first

15    transceiver that uses a plurality of carrier signals for

16    modulating a bit stream."

17          Is that something that Aware invented or did other

18    companies do it first?

19    A.    No, this was known well before the Aware.

20    Q.    And if I look at slide 42, which shows us the Jones

21    reference, can you walk me through how the Jones reference

22    already disclosed this earlier?

23    A.    So the two figures that are shown there are from -- from

24    the patent from Jones.  And on the left is -- in figure 4 is

25    the transmitter.  On the right is figure 5, which is the
```

1   receiver. So this is diagrams of the transceiver. And you

2   can see the data coming in, the coded RA data, that's the bit

3   stream which then is being used to modulate the carrier

4   signals. And this is a multicarrier system.

5   Q.   And so, sir, if we look at slide 43, the beginning of the

6   claim, was that disclosed by Mr. Jones and Cisco before Aware

7   went to the Patent Office?

8   A.   Yes, this was disclosed before the Aware patent

9   application.

10   Q.   Looking at slide 44, the next part of the claim reads,

11   "Wherein each carrier signal has a phase characteristic

12   associated with the bit stream, the transceiver capable of."

13   Again, is that old technology or is that new technology

14   when Aware went to the Patent Office?

15   A.   This was old and well-known.

16   Q.   And on slide 45, tell us whether Jones disclosed it

17   earlier.

18   A.   You can see here a symbol mapper 402. So the bits come

19   in, they get mapped to symbols. Those symbols have a phase or

20   an angle associated with them.

21   Q.   And so, sir, this language in the claim here on slide 46,

22   had Jones already disclosed it before Aware came to the

23   office?

24   A.   Yes.

25   Q.   Looking at slide 47, the next part of the claim reads,

1   "Associating each carrier signal with a value determined

2   independently of any bit value of the bit stream carried by

3   that respective carrier signal, the value associated with each

4   carrier signal determined using a pseudorandom number

5   generator."

6   Is that something Aware invented or was that something

7   that was old before Aware went to the Patent Office?

8   A.   This was well-known technology.

9   Q.   And looking at slide 48, walk me through what Jones says

10   about this.

11   A.   So in box 410 is a scrambler, a phase scrambler. And so

12   what happens in there is the -- a pattern is generated, a

13   random pattern is generated with the values ranging from 0 to

14   3. So 0, 1, 2, 3.

15   In that scrambler would be a -- some kind of a random

16   number generator, a pseudorandom number generator, that would

17   spit out one of the four values, 0, 1, 2, 3, and then that

18   would be used in the next box to generate the phase that would

19   be used to scramble the data.

20   Q.   Thank you, sir.

21   So here on slide 49, again had Jones and Cisco already

22   disclosed this information before Aware ever went to the

23   Patent Office?

24   A.   Yes, it was previously disclosed.

25   Q.   So now looking at slide 50, the next part of the claim

1   recites, "Computing a phase shift for each carrier signal

2   based on the value associated with that carrier signal."

3   Is that something Aware invented or had others done that

4   earlier?

5   A.   No, Aware did not invent that.

6   Q.   And if we look at slide 51, what does Jones say about

7   this?

8   A.   So here what happens is what comes out of the scrambler

9   is that pattern from 0, 1, 2, or 3. And then that goes into

10   this computation, the pi over two times N. N is what comes

11   out of the scrambler. It gets multiplied by pi over 2. So,

12   for example, if it were 1 -- if N were 1, it would be pi over

13   2. And this is computing the phase shift that's going to be

14   used and applied to the data.

15   Q.   So, sir, again, had Mr. Jones and Cisco already disclosed

16   this to the world before Aware ever went to the Patent Office?

17   A.   Yes, this was disclosed before Aware made their

18   application.

19   Q.   So I'm going to break the last part of the claim into two

20   parts.

21   So looking at slide 53, I've highlighted the language,

22   "Combining the phase shift computed for each respective

23   carrier signal with the phase characteristic of that carrier

24   signal to substantially scramble the phase characteristics of

25   the plurality of carrier signals."

1   Is that something Aware invented or was that old

2   technology before Aware went to the Patent Office?

3   A.   This is also old and well-known technology.

4   Q.   And if we look here on slide 54, what does Jones tell us

5   about this?

6   A.   So in this slide you can see on the left is the box 404

7   that creates the redundant symbols. So what you do is you

8   take your data and you repeat it, so you're sending the same

9   values of the data.

10   And so what happens is there is a potential for that

11   block to have a high peak-to-average power ratio because the

12   redundant data are all adding up together. And so you can get

13   a high peak. The solution to that and the way to fix it is

14   you phase scramble the data.

15   So you have a different phase shift for each one of those

16   symbols and, as you can see here, what comes out of the

17   scrambler is -- and then through the computation of the phase

18   is some random phase. And then that is applied to the symbols

19   to fix the problem and lower the peak-to-average power ratio.

20   Where that's applied is in that circle with an X in it,

21   which is 414.

22   Q.   So just to review, there the horizontal, we see box 402

23   and then 404 and 408, is that where the PAR problem surfaces?

24   A.   Yes. It comes from reforming these redundant symbols.

25   Q.   And then the vertical part where we see 410, the

1   scrambler, and then 412, is that fixing the PAR problem?

2   A.   That's fixing the problem, yes.

3   Q.   And looking at slide 55, does Jones tell us that the

4   burster actually scrambled prior to their transmission?

5   A.   Yes. The very first line here -- this is in the spec

6   part. The phases of the frequency domain symbols within the

7   RA burst are scrambled prior to transmission.

8   Q.   And so, sir, was this -- combining the phase shift, was

9   that disclosed by Jones and Cisco before Aware ever went to

10 the Patent Office?

11 A.   It was disclosed before Aware went to the Patent Office.

12 Q.   And if we look at slide 57, the last part of the claim,

13 it reads, "Wherein multiple carrier signals corresponding to

14 the scrambled carrier signals are used by the first

15 transceiver to modulate the same bit value."

16   Is that something Aware had invented or had others

17 already disclosed that earlier?

18 A.   No, that was already disclosed before the Aware

19 application.

20 Q.   And looking here on slide 58, what does Jones tell us

21 about this?

22 A.   So what you do is you're taking and you're creating these

23 redundant bits. And so here we have the D1, D2, and D3 is

24 repeated and is used to modulate other carriers so that

25 the -- this -- the X axis in figure 2-A represents the

1   frequencies, the carrier signals.

2   So you can see D-1 is being used to modulate one carrier

3   and then it's being used to modulate another carrier. So

4   multiple carrier signals are used to modulate the same bit

5   value.

6   Q.   And so, sir, in sum, when we look at all the parts of

7   claim 14 here, did Aware invent that or was that old

8   technology that other companies like Cisco had already

9   invented and disclosed earlier?

10   A.   All of the claim elements in claim 14 were well-known

11   before the Aware application.

12   Q.   And so, sir, in your professional opinion, does claim 14

13   include old and invalid concepts or is claim 14 new and valid?

14   A.   Claim 14 includes old and invalid concepts. So the

15   patent is invalid.

16   Q.   And looking at slide 60, again could you summarize for us

17   the conclusions you've drawn with these two patents?

18   A.   So based on all the stuff I've looked at, including the

19   AT&T FI-071 contribution, the ADSL standard which is before

20   the Aware application, and the '686 -- I mean, the Jones

21   patent which was before the Aware application, that the claims

22   in the '686 and '008 Patents were old and well-known

23   concepts --

24   Q.   Thank you. I'm sorry?

25   A.   And so the '686 Patent and '008 Patent are invalid.

1   Q.   Thank you, Doctor Cimini.

2   I pass the witness.

3   Q.   Good afternoon, Doctor Cimini. Nice to see you again.

4   A.   Hello.

5   Q.   You may recall that I am Peter McAndrews. I represent TQ

6   Delta in the case.

7   A.   Yes.

8   Q.   Now, Doctor Cimini, for the '686 Patent and the '008

9   Patent, the functionality of the TQ Delta accused of

10 infringement is defined in the standard called G.993.2. Is

11 that right?

12 A.   Yes.

13 Q.   And that's the VDSL2 standard?

14 A.   Yes.

15 Q.   And that standard was developed by an organization called

16 the ITU-T. Correct?

17 A.   Correct.

18 Q.   Okay. And this morning you testified about the G.992.1

19 standard. Right?

20 A.   Yes.

21 Q.   And that is also a standard developed by the ITU-T. Is

22 that right?

23 A.   That's correct.

24 Q.   Okay. You've never been a member of the ITU-T, have you?

25 A.   I have not personally been a member.

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 1   Q.   Okay.  And you've never participated in any of the

 2   standards development work of the ITU-T.  Is that right?

 3   A.   I participated in a standard around the year 1999 or 2000

 4   for what at that time was called IMT 2000.

 5   Q.   And you've never participated in any ITU-T DSL standards

 6   development activity.  Is that correct?

 7   A.   That is correct.

 8   Q.   So it's true that you never contributed any ideas or

 9   inventions to a DSL standards development organization.  Is

10   that correct?

11   A.   That is not correct.

12   Q.   Okay.  You've never contributed any ideas or inventions

13   to the ITU-T DSL standards organization.  Is that correct?

14   A.   Correct.

15   Q.   Okay.  And, in fact, at no time from 1993 up until your

16   involvement as an expert witness against TQ Delta have you

17   even looked at any DSL standards documentation.  Right?

18   A.   I had not looked at DSL standards, correct.

19   Q.   Now, I want to ask you a couple of questions about the

20   992.1 standard.  If you could turn to slide 10 of your

21   demonstratives.  It's in the binder there next to you.

22        And if you recall, when CommScope's attorney --

23   A.   I have to get the right page.  I'm sorry.  Slide 10?

24   Q.   Slide 10.

25   A.   Yes.
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1   Q.   Yes, that's it. That's slide 10?

2   A.   Thanks.

3   Q.   So if you recall when CommScope's attorney was asking you

4   questions, you testified that the Patent Office was not aware

5   of the G.992.1 standard at the time it reviewed TQ Delta's

6   patent. Is that right?

7   A.   Correct.

8   Q.   Okay. Do you see there it says modulation -- I'm sorry.

9   The highlighted language on the page there, your slide, it

10   says, modulated by using one bit per DMT symbol modulation, as

11   used in the C-rates 1 message in the ITU and ANSI ADSL

12   standards. Do you see that?

13   A.   Yes.

14   Q.   Okay.

15   A.   You pointed that out.

16   Q.   And the ITU and ANSI ADSL standards at that time included

17   G.992.1. Right?

18   A.   Yes.

19   Q.   Okay. So the Patent Office was told about the G.992.1

20   standard. Correct?

21   A.   They -- yes.

22   Q.   Sticking with 992.1, you'll have it in your binder just

23   to your left. The 992.1 standard is Exhibit 48. It should be

24   the bottom binder to your left behind a tab that should

25   indicate Exhibit 48.

1   Now, you testified that the ITU G.992.1 standard was

2   published as of June '99, didn't you?

3   A.   Yes.

4   Q.   Okay. But if you could turn to the third page and at

5   small Roman I, do you see at the bottom it reads, "ITU-T

6   recommendation G.922.1 was prepared by the ITU-T study group

7   15 (1997-2000) and was approved under the WTSC Resolution No.

8   1 Procedure on 22 June 1999." Do you see that?

9   A.   Yes.

10   Q.   So it indicates that it was still being prepared through

11   the year 2000. Correct?

12   A.   It was still being prepared, yes.

13   Q.   Okay. In fact, if you turn to the next page and you look

14   at the bottom of small Roman 2, it bears a copyright date, ITU

15   2000. Do you see that?

16   A.   Yes, I do.

17   Q.   And you're familiar what a copyright date typically

18   means, aren't you?

19   A.   Yes.

20   Q.   Okay. So you don't know whether G.992.1 was actually

21   published in June '99, do you?

22   A.   When the document says June '99, that usually means when

23   it was published and available for all within the ITU to see.

24   And that was my statement.

25   Q.   But you're not a member of the ITU and you don't know the

1   procedures they follow in publishing their documents.

2   Correct?

3   A.   I'm not a member, but I still know how standards bodies

4   usually work.

5   Q.   Okay. But you don't know how the ITU in particular

6   works. Correct?

7   A.   Some details I do, and some I do not.

8   Q.   Okay. And can you explain for me -- and I'm sorry. And

9   you cannot explain to me why it bears a copyright of 2000, can

10 you?

11 A.   I don't know when the copyright happens, but I know that

12 the document is published for all to see and then there's some

13 official final date.

14 Q.   Okay. And sticking with the same notebook there, Exhibit

15 47, if you could turn to that, please.

16   And that document is the FI-071 contribution you rely on

17 for your invalidity opinions. Correct?

18 A.   Correct.

19 Q.   Okay. And FI-071 is a contribution to the ITU-T study

20 group 15. Correct?

21 A.   Correct.

22 Q.   Okay. And you'd have to be a member of the ITU in order

23 to have -- in order to have attended the conference in Fiji

24 where this paper was presented. Correct?

25 A.   I don't think that's correct. I think people who are not

1 members can attend because I've attended standards meetings.

2 But I was not personally a member and I could not vote.

3 Q.   Okay. You've never attended an ITU-T study group 15

4 meeting. Correct?

5 A.   Correct.

6 Q.   You don't have any personal experience with how you get

7 into those meetings. Correct?

8 A.   No, I don't, but I assume they're the same as other study

9 groups I've been involved in.

10 Q.   Okay. Now, earlier on one of your slides, you had the

11 picture of a link to -- that you claim was a link to the

12 FI-071 document. Correct?

13 A.   Yes, correct.

14 Q.   Okay. You didn't click on that link. Correct?

15 A.   No, I did not.

16 Q.   Okay. You've never clicked on that link and accessed the

17 FI-071 document. Is that right?

18 A.   No, I did not.

19 Q.   Okay. Do you know if anyone was able to click on that

20 link and collect the FI-071 document?

21 A.   I'm sure that that was available for that purpose at the

22 Fiji meeting.

23 Q.   But it was not available to you. Right?

24 A.   I didn't try to access it.

25 Q.   Okay. Now, this morning you also had on a slide a web

1   page of the *Dallas Morning News*. Right?

2   A.   Yes.

3   Q.   Okay. And your suggestion with that slide was that all

4   you had to do was a pay a fee and sign up and you could click

5   on whatever was available there. Right?

6   A.   Correct.

7   Q.   Okay. That's not the case with the ITU, though. Right?

8   You are not able to simply click on links. Right?

9   A.   If you're a member and you have access, like in this

10   meeting, you should be able to click on it and get --

11   Q.   Okay. And did you know that in order to get access to be

12   a member of the ITU, first of all, you have to be a

13   corporation. Did you understand that?

14   A.   I believe that's true, yes.

15   Q.   Did you understand that you have to be approved by the

16   U.S. State Department to be a member of the ITU?

17   A.   I was not aware of that, but I'm not surprised that --

18   Q.   Okay. To get access to the *Dallas Morning News* news, you

19   would assume you don't need approval from the U.S. State

20   Department. Correct?

21   A.   I do not.

22   Q.   Okay.

23   A.   Correct.

24   Q.   So it's not as public as it would be to click on the

25   *Dallas Morning News* link. Correct?

1   A.   It's not as public, but it's -- it's public to those that

2   need access to it.

3   Q.   Okay. You are someone who purports to be an expert in

4   DSL technology. Correct?

5   A.   Correct.

6   Q.   Okay. And you have an interest in DMT. That's a DSL

7   technology. Right?

8   A.   Yes.

9   Q.   Okay. You're testifying as an expert on DSL technology

10   in this case. Right?

11   A.   Correct.

12   Q.   And yet you've never had access to ITU-T documents.

13   Correct?

14   A.   I had access to the ITU documents through AT&T who was a

15   member of the ITU.

16   Q.   So if you could take a look at the binder. It's now the

17   only binder you haven't looked at just yet. It's to your

18   left. It's to your left. And if you go to page 67.

19   And before I have you read anything on the page, do you

20   recognize this document as being a copy of a transcript of

21   your deposition that took place on December 7, 2022, related

22   to this matter?

23   A.   Yes, it appears to be my deposition.

24   Q.   Okay. And you had an opportunity to review this

25   transcript and provide an errata for any corrections that you

1   saw that were wrong about the transcription?

2   A.   What I did is provide corrections for words. I didn't

3   change any -- make any changes or clarify any of my

4   statements.

5   Q.   Okay. But you had an opportunity to do that?

6   A.   Yes. But in the past with depositions, I was -- it was

7   strongly suggested not to do that. Just correct errors of

8   words or speech and not the content.

9   Q.   Okay. So back to page 67, and I want to read to you

10   beginning at line 18, and then this extends through the first

11   line of page 68.

12   And it says, "Did you in that time frame ever actually

13   gain access to any of those documents?"

14   Answer: "Okay. So you -- make sure I understand this.

15   It's ITU working group 15 so you made it very specific."

16   Question: "Correct."

17   Answer: "Yes. So the answer is no, I did not have -- I

18   don't remember having access to any of those documents."

19   Did I read that correctly?

20   A.   Yes.

21   Q.   So, again, Doctor Cimini, you personally as an expert in

22   the DSL field did not have direct access to FI-071 at any

23   time. Correct?

24   A.   That is correct.

25   Q.   Okay. So I'd like you to look at FI-071. So this back

1   to the other notebook that has Exhibit 47 in it. And if you

2   recall, it was your opinion that FI-071 discloses the element

3   of claim 36 of the '686 Patent that recites, "using

4   multicarrier modulation with DMT symbols that are mapped to

5   one bit of the diagnostic message." That was your opinion.

6   Right?

7   A.   Correct.

8   Q.   Okay. Now, FI-071 does not itself describe any specific

9   manner of communicating diagnostic information. Right?

10   A.   It simply says, via standardized messages.

11   Q.   Okay. And, in fact, you agree that it is not specific as

12   to what standardized messages will be used. Is that right?

13   A.   Simply says standardized messages and doesn't give any

14   more specifics.

15   Q.   Okay. And you would agree that a standardized message is

16   not necessarily a one-bit per DMT symbol message. Correct?

17   A.   Can you repeat that, please?

18   Q.   You would agree that a standardized message is not

19   necessarily a one-bit per DMT symbol message. Correct?

20   A.   It is not necessarily, but it could be.

21   Q.   Okay. And there are multiple ways that a message can be

22   sent that are not one-bit per DMT symbol and yet be a

23   standardized message. Correct?

24   A.   That is correct.

25   Q.   Same notebook, if you could turn to Exhibit 48, I'm not

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1    sure that you'll have to reference it, but I'm going to ask

2    you a few questions about and that's G.992.1.  Right?

3    A.   Yes.

4    Q.   Okay.  So, now, you relied on the C-rates messaging

5    scheme described in G.992.1 for your invalidity opinions.

6    Right?

7    A.   Yes.

8    Q.   And your opinion is that the language of claim 36 that

9    talks about DMT symbols mapped to one bit of the diagnostic

10   message, it reads on the C-rates messaging scheme of G.992.1.

11   Right?

12   A.   Yes.

13   Q.   Okay.  And in C-rates, a DMT symbol is mapped to the

14   single bit value of 1 or 0.  Right?

15   A.   Correct.

16   Q.   Okay.  Now, G.992.1 itself describes transmitting

17   diagnostic information.  Correct?

18   A.   Correct.

19   Q.   But when it transmits diagnostic information, it uses

20   something called the embedded operations channel.  Is that

21   right?

22   A.   It can, yes.

23   Q.   It can.

24   A.   Uh-huh, yes.

25   Q.   Okay.  The embedded -- are you aware of any other way --
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 1     you're not aware of any other way that diagnostic information

 2     is transmitted in G.992.1.  Correct?

 3     A.    I can't exclude any possibility.  Right?  It's a large

 4     document.

 5     Q.    Okay.  But as you sit here today, according to the

 6     knowledge that you possess today, diagnostic information

 7     transmitted in 992.1 does not use anything other than the

 8     embedded operations channel.  Correct?

 9     A.    I can only say I -- that's possibly so, but I don't have

10     enough information to say it's completely true.

11     Q.    Okay.  But you -- the flip side of that is you would

12     agree with me that diagnostic information in G.992.1, it is

13     transmitted using the embedded operations channel.  Correct?

14     A.    Yes.  That's why I said it could be.

15     Q.    Okay.  And so the embedded operations channel --

16     A.    I just said there might be other transmission modes.

17     Q.    The embedded operations channel of G.992.1 does not use a

18     modulation scheme in which DMT symbols are mapped to one bit.

19     Correct?

20     A.    Correct.

21     Q.    Okay.  And, instead, the only time in G.992.1 where DMT

22     symbols are mapped to one bit is during the C-rates message of

23     initialization.  Correct?

24     A.    Right.  That's what we pointed to.

25     Q.    Okay.  And the C-rates message of initialization is not
```

1   diagnostic information. Correct?

2   A.   The C-rates information is not diagnostic information.

3   It's a specification, sort of.

4   Q.   Okay. Now, you would agree with me that the embedded

5   operations channel provides some measure of robustness.

6   Correct?

7   A.   Correct.

8   Q.   It uses a repetition and acknowledgement scheme to

9   provide robustness. Correct?

10   A.   Correct.

11   Q.   Okay. And it uses some coding to provide robustness as

12   well. Is that right?

13   A.   Correct.

14   Q.   Okay. And there's nothing written in G.992.1 that

15   suggests that the embedded operations channel is not

16   sufficient for what it's set out to do. Correct?

17   A.   In 992.1?

18   Q.   Correct.

19   A.   Correct.

20   Q.   Now, Exhibit 50 in your notebook, if you could please

21   take a look at that. Exhibit 50 is the Jones patent that you

22   rely on for your invalidity opinions on TQ Delta's '008

23   Patent. Right?

24   A.   Yes.

25   Q.   Okay. And Jones, in general, describes a wireless

1   communication system. Is that right?

2   A.   Yes.

3   Q.   Okay. And it's a wireless system like a cellular phone

4   or WiFi system. Is that right?

5   A.   Correct.

6   Q.   Okay. And it's a system where there's multiple mobile

7   subscriber units that are communicating with the head end like

8   a cellular base station or a WiFi access point. Is that

9   right?

10   A.   That's correct.

11   Q.   Okay. And it describes a system where multiple

12   subscriber units are simultaneously attempting to gain access

13   over the same channel to communicate with the head end.

14   Right?

15   A.   Correct.

16   Q.   Okay. Jones does not described use of his system in DSL.

17   Correct?

18   A.   Correct.

19   Q.   Now, claim 14 of the '008 Patent is directing to reducing

20   PAR in a transmission signal. Is that right?

21   A.   Correct.

22   Q.   Okay. But Jones' technique, at least as he describes it,

23   is focused on reducing PAR at a head end receiver. Is that

24   right?

25   A.   That's the motivation.

1   Q.   Okay. And at the head end receiver, there are multiple

2   transmissions from multiple subscriber units arriving at the

3   same time. Right?

4   A.   Correct.

5   Q.   Okay. And there's a concern with something called

6   saturation of the receiver. Correct?

7   A.   Correct.

8   Q.   Okay. So it's not -- it's not concerned with clipping at

9   any particular transmitter. Is that right?

10   A.   The word 'clipping' is not in the patent, I believe. It

11   might be, but not -- it's not a focus here.

12   Q.   Okay. And having a high PAR at the head end receiver

13   does not necessarily mean that there is a high PAR at any

14   particular transmitter. Correct?

15   A.   That's true, but it doesn't preclude that from

16   being -- happening.

17   Q.   So I'd actually like you to focus on -- this is -- and I

18   apologize. This is now your slide in your demonstrative.

19   It's a binder that's to your right now?

20   A.   Okay.

21   Q.   If you could turn to your slide 14, please.

22   Actually, I'm sorry. My mistake. It's actually slide

23   42. Okay.

24   So your slide 42 is directed to the element A of the

25   claim as you listed which is a multicarrier system including a

1   first transceiver, et cetera. Do you see that?

2   A.   Yes.

3   Q.   Okay. And what you've depicted there on the page on the

4   left-hand side is figure 4 of Jones. Correct?

5   A.   Correct.

6   Q.   And on the right-hand side, you've depicted figure 5 of

7   Jones. Right?

8   A.   Correct.

9   Q.   Okay. So on the left-hand side, that's -- figure 4 is

10   illustrating the transmitter of one of the subscriber units.

11   Correct?

12   A.   Correct.

13   Q.   And on the right-hand side, it's illustrating the

14   receiver of the head end unit. Correct?

15   A.   Correct.

16   Q.   So the transmitter on the left and the receiver on the

17   right are in two different devices. Correct?

18   A.   Yes. Yes. I'm sorry.

19   Q.   Now, sticking with Jones, and Jones will be Exhibit 4 in

20   the binder of exhibits. I'm sorry. Again, apologize on

21   exhibit numbers. So this is -- Exhibit 50 in the binder of

22   exhibits is Jones.

23   Okay. Now, claim 14 of the '008 Patent, you have

24   concluded that the element of the claim that requires a

25   pseudorandom number generator to generate values that are used

1   for phase scrambling, you've concluded that Jones discloses

2   that. Right?

3   A.   Yes.

4   Q.   Okay. And that was your testimony earlier today. Right?

5   A.   Yes.

6   Q.   Okay. Jones does not say that scrambler 410 is using

7   a pseudorandom sequence of values. Right?

8   A.   I can't answer that with a simple yes or no.

9   Q.   All right. In fact, it's your opinion that Jones could

10   be using the series sequence 0123, 0123. Right?

11   A.   I don't believe that's my testimony. I said it could be

12   using anything.

13   Q.   Okay.

14   A.   Any random pattern or a series of pattern. But the

15   series doesn't -- didn't make any sense to me. That was my

16   testimony in the -- earlier.

17   Q.   I'm sorry. You agree with me and it's your opinion that

18   it could be using a series pattern 0123, 0123. Correct?

19   A.   Yes, it could possibly be.

20   Q.   Okay. And Jones doesn't say one way or the other whether

21   it's using a series pattern or a pseudorandom pattern.

22   Correct?

23   A.   That's correct.

24   Q.   You didn't do anything to simulate the PAR of Jones, did

25   you?

1   A.   I did not simulate the head end peak-to-average power

2   ratio.

3   Q.   You did not simulate the PAR of Jones in any way, did

4   you?

5   A.   I did not personally simulate and compute the

6   peak-to-average.

7   Q.   Okay. And you did not simulate -- and, therefore, you

8   did not attempt to compare the PAR that would result from a

9   series pattern to a PAR that would result from a pseudorandom

10   pattern, did you?

11   A.   I did not compute the PAR at the head end.

12   Q.   So you didn't perform any simulations attempting to

13   determine which one would be better in Jones' system, did you?

14   A.   I did not.

15   Q.   And, in fact, you don't know for sure which would be

16   better in Jones' system. Correct?

17   A.   Not for the PAR at the head end.

18   Q.   This morning we didn't hear anything about your

19   infringement opinions, did we?

20   A.   That's correct.

21   Q.   And you provided an expert report addressing the issue of

22   infringement on the '686 Patent and '008 Patent. Correct?

23   A.   Yes.

24   Q.   And you put a substantial amount of time into preparing a

25   report that addressed those issues?

1   A.   Yes.

2   Q.   Okay. And TQ Delta's experts responded to your report

3   with a number of expert reports. Correct?

4   A.   Correct.

5   Q.   Okay. And, in fact, there were several hundred pages of

6   the reports generated that addressed the issue of infringement

7   in this case. Right?

8   A.   That's correct.

9   Q.   Okay. And TQ Delta's attorneys took your deposition on

10 your infringement report. Is that right?

11 A.   Yes.

12 Q.   Okay. And yet you didn't say anything about infringement

13 today, did you?

14 A.   No.

15 Q.   Sir, at your time at AT&T, were you focused on more

16 advanced technologies than DSL?

17 A.   Yes. I was working on next generation cellular. The

18 stuff that I worked on made its way eventually into 4G and 5G.

19 3G didn't use that technology, either. So it was way ahead.

20 That was our job, to look way ahead, and there were business

21 units in AT&T that worked on the more present technology that

22 was going to be deployed soon.

23 Q.   And, sir, was AT&T, your employer, were they a member of

24 the ITU?

25 A.   Yes, AT&T was a member of the ITU.

```
1    Q.   And so if you needed any access to ITU documents as an

2    employee of AT&T, did you have access to them?

3    A.   I had access through the people who were working on DSL

4    and a member in the ITU.

5    Q.   I'd like for you to look in your binder at Exhibit 48.

6    Let me know when you're there, sir.

7    A.   Is it in this -- in ours or in here?

8    Q.   In the binder with the exhibits right there.  Yes, sir.

9    Exhibit 48, please.

10   A.   Okay.  Yes.

11   Q.   And again, remind us, what is Exhibit 48?

12   A.   This is the ITU ADL [sic] standard G.992.1.

13   Q.   And there was some suggestion about the publication date

14   of this when Mr. McAndrews was asking you questions.  What

15   does it say right on the cover about when this standard was

16   adopted?

17   A.   The document has a date of June 1999.  It's my

18   understanding that that is when this document was published

19   and available to all of the members.  This had been agreed

20   upon by this time.

21   Q.   So after this document is agreed upon by all of the

22   members, is it typical for some engineer to try to claim

23   credit for it after they've already received this document

24   from others?

25   A.   That's not the way it should be done.
```

1   Q.   Okay. So, sir, as of the end of June 1999, could any ITU

2   member see this ADSL document that we have here as Exhibit 48?

3   A.   Yes, I believe they would be able to see this document.

4   Q.   Okay. And there was a suggestion about the AT&T

5   contribution -- he asked you a lot of questions about whether

6   it was public. Was the AT&T document some sort of super

7   secret document or was AT&T contributing that to the standard

8   for everyone to see?

9   A.   Contribution FI-071 was a contribution to the study

10   group, and it would have been available to anyone that had

11   access to those documents. It would have been all the ITU

12   members, anybody from the DSL community.

13   Q.   So if anyone was left with the impression from questions

14   that you received about whether that document is secret, would

15   you agree with that or would you disagree with that?

16   A.   I would disagree if they said that document was secret.

17   That document was public to all of the DSL members that were

18   interested in the topic.

19   Q.   And so, for example, your employer, AT&T, did your

20   employer AT&T have access to the AT&T document that was shared

21   before this meeting in the end of January or the beginning of

22   February?

23   A.   The -- the people who were working in DSL at AT&T at the

24   time would surely have had access to this document.

25   Q.   So there was also a suggestion about where the inventors

1   got the idea for using the one-bit per message -- I'm sorry,

2   one bit per symbol message. Do you remember questions from

3   that that you received?

4   A.   Yes.

5   Q.   I'd like to turn to slide 27 that we looked at earlier.

6   And, sir, here on slide 27, you know, we don't need to

7   look to other documents. What did the inventor himself say

8   about whether he had taken this one-bit per symbol message

9   from the prior existing standard?

10   A.   So Mr. Pizzano, the inventor, when asked that question,

11   said that he -- about the '686 Patent, he said that that

12   one-bit per symbol messaging was basically just reusing

13   existing standardized symbols. So he pulled it from the ITU

14   standard.

15   Q.   Again, is Mr. Pizzano saying that that was a concept he

16   invented or is Mr. Pizzano saying that was a concept taken

17   from an earlier standard?

18   A.   It's a concept that he took from an earlier standard, an

19   existing standard.

20   Q.   Thank you, sir.

21   Now, I'd like to -- if we can look at slide No. 40, I'd

22   like to talk about the '008 Patent or the '008 Patent. And

23   I'd like to look at claim 14.

24   So there was a question from opposing counsel as to

25   whether the Jones reference was talking specifically about

1   DSL. Is there anything in claim 14 that requires this

2   specifically to be for DSL?

3   A.   There is nothing in claim 14 that says that this is a DSL

4   application.

5   Q.   Does claim 14 mention the letters DSL?

6   A.   It does not.

7   Q.   So is claim 14 specific to DSL or can it be used in other

8   telecommunications areas?

9   A.   It should be able to be used in any place that uses a

10   multicarrier system.

11   Q.   And was Jones about a multicarrier system?

12   A.   Yes.

13   Q.   You were also asked some questions during

14   cross-examination about clipping. Is the word 'clipping' in

15   claim 14?

16   A.   No. Clipping is not in claim 14.

17   Q.   What is your understanding of your responsibility when

18   you're assessing validity? What are you supposed to be

19   comparing the prior art to?

20   A.   To these claims as written here.

21   Q.   And, again, is the word 'clipping' in there anywhere?

22   A.   No, it is not.

23   Q.   Okay. So I'd like to look now at slide 54 where we

24   discussed a little bit about Jones. Let me know when you have

25   slide 54 in front of you, please, sir.

1   A.   I have it.

2   Q.   Okay. There was also a question from counsel about

3   whether using a pseudorandom number generator would reduce PAR

4   more greatly than some other method. Does the claim require

5   anything about reducing PAR more greatly than some other

6   method?

7   A.   The claim only states that you need to substantially

8   scramble, which was -- the claim construction from the Court

9   was that that means reduce the PAR.

10   Q.   And does it have to be reduced better than some other

11   technology or can it just be reduced?

12   A.   It just has to be reduced.

13   Q.   Okay, sir. And so looking here at figure 4 from Jones,

14   in your professional opinion, was -- is the PAR reduced?

15   A.   If you have redundant symbols and you scramble the

16   phases, it will reduce the peak-to-average ratio.

17   Q.   And would a person of skill in the art back in 1999

18   recognize that from this Jones reference?

19   A.   Yes, they would have.

20   Q.   Okay. And when Mr. Jones from Cisco, before Aware went

21   to the Patent Office, when he reports that the phase

22   scrambling pattern consists of a series of values ranging from

23   0 to 3, would somebody who was skilled in the art understand

24   that to be done by a pseudorandom number generator?

25   A.   I believe that the output from the scrambler is generated

1   by a pseudorandom noise generator. That's how I would have

2   done it.

3   Q.   And there in figure 4, do we see a box that says Random

4   Number Generator?

5   A.   That's box 406.

6   Q.   Thank you, sir.

7   Q.   It's me again. I'm Peter McAndrews on behalf after TQ

8   Delta. I just have a few questions for you.

9   If you could -- and it looks like you're still on slide

10   54 --

11   A.   Yes.

12   Q.   -- of your presentation? The last question you were

13   asked was about box 406 that includes the words Random Number

14   Generator. Correct?

15   A.   Correct.

16   Q.   You agree with me that that random number generator is

17   not connected to the scrambler box 410. Correct?

18   A.   In the diagram, the random number generator is not

19   connected to the scrambler.

20   Q.   And, in fact, that random number generator is described

21   in the Jones patent as being used to select carriers, not to

22   scramble phases. Correct?

23   A.   It's described in Jones to select the training tones.

24   Q.   To select the training tones.

25   A.   Yes.

1   Q.   It has nothing to do with box 412 that you described as

2   applying the values that come out of the scrambler to modify

3   phases. Correct?

4   A.   Box 406, that's true.

5   Q.   Okay. I have no further questions.

6   THE COURT: Does that complete this witness by

7   deposition?

8   MR. STEVENS: It does, although I have updated times

9   for the video. If I could re-read those, Your Honor?

10   THE COURT: That would be good because our

11   calculations exceeded what you had told me.

12   MR. STEVENS: For CommScope, I have 55 minutes and 3

13   seconds. And for TQ Delta, I have 26 minutes and 37 seconds.

14   THE COURT: All right. I understand you have a few

15   additional short depositions?

16   MR. STEVENS: We do, Your Honor?

17   THE COURT: Let's proceed with those.

18   MR. STEVENS: Thank you.

19   MS. WROBLEWSKI: Your Honor, Karlee Wroblewski on

20   behalf of CommScope, and we call Robert Pizzano by deposition.

21   Mr. Pizzano is a named inventor on the '686 Patent.

22   And for time allocations, 25 minutes and 48 seconds

23   should be attributed to CommScope and 4 minutes and 30 seconds

24   to TQ Delta.

25   THE COURT: Let's proceed with this witness.

ROBERT EDMUND PIZZANO, JR., BY SWORN DEPOSITION,

1

2   Q.   Good morning, Mr. Pizzano.

3   A.   Good morning.

4   Q.   Will you please state your name for the record?

5   A.   Sure. Robert Edmund Pizzano, Jr.

6   Q.   And if you would pull that up, do you see there that this

7   is, in the upper right-hand corner, U.S. Patent No. 7,570,686?

8   A.   Yes, I see that.

9   Q.   You see that. And you're listed -- if you go to the

10   right-hand side where it says 75, you are listed as a named

11   inventor, Robert Edmund Pizzano, Jr. Is that right?

12   A.   That's correct, left-hand side.

13   Q.   Okay. Do you recognize Exhibit 5?

14   A.   I believe I recognize it from my prior deposition. And

15   if I'm correct, this is not the original patent. This is --

16   this is issued after. This was a subsequent issuance that I

17   was not involved in.

18   Q.   Okay. And I guess when you say issued after, are you

19   saying you were involved in the filing of a provisional

20   application, not necessarily this document as you see it now?

21   A.   So while I was at Aware, I worked on a single patent, the

22   original patent --

23   Q.   Yes.

24   A.   -- and I was involved in that. All subsequent, whatever

25   you call them, follow-on patents, I was not involved in.

1   Q.   Fair enough. So based on your work and involvement in

2   the original version of the patent, could you state in your

3   own words what the invention was that was within that patent?

4   A.   So -- and this is a -- this is a slippery slope. So I'm

5   not a patent attorney, I'm not an expert in patents. So I did

6   engineering work.

7   I was then asked to work with, you know, people on a

8   patent group to tell them what my engineering work was, and

9   then they would decide whether it was patentable or not. So,

10   you know, as far as giving opinions on inventions and that, I

11   just don't -- I don't remember and I don't have the -- I

12   probably didn't even have the qualifications at the time.

13   Q.   So sitting here today, you're not able to tell me a

14   single thing that you deem as being the invention of this

15   patent?

16   A.   A single thing? Yeah, I object to the question. I

17   did -- I did work. I created a design, and then people said

18   that was -- that was patentable and I did that 25 years ago.

19   I just -- I'm not going to try to give you a single answer

20   that encompasses what is a -- however long that document is

21   and is very complex and has legalese. It's just not my area,

22   and -- and for me to speculate or -- or say something wouldn't

23   -- wouldn't be useful.

24   Q.   Okay. And did you submit a specific invention disclosure

25   form relating to the subject matter of this patent?

1   A.   I don't recall the method that I used to let people know

2   that there was work that -- that was possibly patentable, but

3   I -- I communicated that in -- in some fashion. I probably

4   did it, you know, it was -- I did whatever was -- was given to

5   me as the process at the time. I don't recall what that

6   process was.

7   Q.   Okay. And same with respect to you don't recall how

8   Aware determined that this was an invention it wanted to move

9   forward in patenting?

10   A.   Yes.

11   Q.   Is that fair?

12   A.   I was not involved in making those decisions, so I don't

13   know what criteria they used or -- or how they came to that

14   determination.

15   Q.   Okay. And what was your involvement in the prosecution

16   of the patent, if any?

17   A.   Could you define that prosecution for me?

18   Q.   Sure. Did you help create the original filing that was

19   put before the Patent Office? Did you have any involvement

20   with the attorney who was processing your application?

21   A.   I believe I had one or more meetings with the attorney

22   that was prosecuting, developing, where he asked me questions

23   and -- and -- and I answered them.

24   Q.   Do you recall what sorts of questions he would have asked

25   you?

1   A.   Yeah. And the answer is, oh, God, no. 25 years ago,

2   having a half hour conversation with a lawyer, I don't recall

3   a thing.

4   Q.   Okay. And do you recognize this document?

5   A.   Yeah, hold on a second. The size is all messed up.

6   Q.   If we could please mark Exhibit 6.

7   A.   I think I was shown this in my prior deposition,

8   but -- yeah, I think that's -- I think I've seen this before,

9   yes.

10 Q.   Yep. And for the record, this page is marked as

11 TQD_TX_00263505.

12   And so if you'll just take a moment to scroll through

13 this document. Were you involved in the development of this

14 write-up or submission?

15 A.   I don't know if I was the primary author. And pardon me

16 for -- for leaning over, but I'm -- I'm trying to read it.

17 But certainly the -- the terminology, the sentence, and these

18 diagrams, the table 1, that is -- is -- is familiar to me. So

19 I either worked on it or that is -- is -- is my work.

20 Q.   And so you see claim 36, there's a bold 36 in front of

21 it?

22 A.   I see that.

23 Q.   Okay. Did you invent sending test information?

24 A.   No, I did not.

25 Q.   Did you develop SNR, or signal-to-noise ratio?

213

1   A.   I did not.

2   Q.   Did you develop QLN, or quiet line noise?

3   A.   Noise is just noise. I did not invent it.

4   Q.   Okay. And did you develop a particular means of

5   modulation to allow for the conveyance of a diagnostics

6   message?

7   A.   No.

8   Q.   So this REVERB and SEGUE signal that you just referenced

9   in your previous answer, is that what you're referring to?

10   A.   REVERB and SEGUE are other -- are other defined symbols

11   or phases in the -- in the ANSI and the ITU standards.

12   Q.   And so where it says a bit with value zero is mapped to

13   the REVERB signal and a bit with value one is mapped to a

14   SEGUE signal, that was a concept that was known in the

15   standard prior to development of this invention. Is that

16   correct?

17   A.   Yes. This is part of the ITU standard.

18   Q.   Okay. And do you recognize Exhibit 7?

19   A.   The formatting, the nomenclature is -- is familiar to me.

20   I -- I can't tell you, you know, if I've seen this before or

21   other documents like it. But, yeah, it's essentially -- I

22   know what it is.

23   Q.   And what is it?

24   A.   It's a -- the International Telecommunications Unit,

25   which ITU. They are the standards body that does the DSL

 1   work.

 2   Q.   Okay.

 3   A.   This is a document that describes ADSL.

 4   Q.   And right under where it says G.992.1, what is the date

 5   on this document?

 6   A.   Reading the document, it's 06/99.

 7   Q.   Okay. And so if we turn to PDF page 110.

 8   A.   Yes, I'm on 110.

 9   Q.   So right in the center of the page, it says, table

10   10-5/G.992.1-C-rates1.

11   A.   So I have a page number down in the lower left that says

12   96, and then after that, it says recommendation G.992.1, 6/29.

13   Q.   Yes.

14   A.   So that's the page you're talking about?

15   Q.   Yep. So right in the center of that page, you should see

16   table 10-5.

17   A.   Ah. Yes, I do.

18   Q.   Yes. And so following that label, it says C-rates1. Do

19   you see that?

20   A.   Yes, I do.

21   Q.   And is that the same C-rates that is described within the

22   specification of the '686 Patent?

23   A.   I have no reason to think it's not. So it

24   wasn't -- we -- we used the ANSI standards. So this is the

25   ANSI document or the ITU document.

1   Q.   Okay. And you'll see in the paragraph immediately below

2   that table, it says, A zero bit is encoded to one symbol of

3   the C-REVERB and a one bit is encoded to this one symbol of

4   the C-SEGUE1.

5   A.   I -- I read that, yes.

6   Q.   Okay. My question is, what method of modulation are you

7   using for the diagnostic mode in your patent, in the '686

8   Patent?

9   A.   Again, the patent is not something that -- that I wrote,

10   I'm familiar with, or that I'm prepared to answer questions

11   to.

12   The diagnostic link in the -- in the development work I

13   did, in order to be able to push that data through under the

14   worst conditions, we used the -- the -- the one-bit per symbol

15   messaging scheme. I don't recall exactly what ITU feature it

16   was, but it was -- yeah, it was -- it -- the diagnostic link

17   that -- that -- that I wrote the work for had -- had the

18   one-bit signal.

19   Q.   Okay. That you pulled from the ITU standard.

20   A.   We reused existing standardized symbols, correct.

21   THE COURT: Does that complete this witness by

22   deposition?

23   MR. STEVENS: It does, Your Honor.

24   THE COURT: All right. Present your next deposition

25   witness, please.

1   MR. STEVENS: Dr. David Krinsky, currently of

2   Qualcomm. He's also a named inventor on the '686 Patent.

3   The time is 7 minutes and 19 minutes to CommScope and 52

4   seconds to TQ Delta.

5   THE COURT: Please proceed with this witness by

6   deposition.

7   MR. STEVENS: Thank you, Your Honor.

8   DAVID MARTIN KRINSKY, PhD., BY SWORN DEPOSITION,

9   Q.   Could you please state your full name:

10 A.   David Martin Krinsky.

11 Q.   And, Mr. Krinsky, there was a point in time where you

12 worked at a company called Aware. Is that correct?

13 A.   That's correct.

14 Q.   And, Mr. Krinsky, you don't work for TQ Delta, do you?

15 A.   No.

16 Q.   And in the event that there would be any award in this

17 case, you don't expect TQ Delta to pay you a penny of that

18 award, do you?

19 A.   No.

20 Q.   Who do you work for now, Mr. Krinsky?

21 A.   Qualcomm.

22 Q.   So I'd like to discuss with you what you were doing at

23 Aware that led to the project for which you filed the patent

24 application that matured into the '686 Patent.

25 A.   Sure.

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1    Q.    Do you recall working on a particular project that led to

2    the application of the '686 Patent?  Did there come a point in

3    time where Aware exited that business?

4    A.    Yes.

5    Q.    And when was that?

6    A.    I don't -- I don't know.

7    Q.    Did you ever make a physical modem that actually used the

8    technology claimed in the '686 Patent?

9    A.    I don't -- I don't know.

10   Q.    And you also said that you designed chips for other

11   people?  Did I hear that correctly?

12   A.    Yes, we did.  We designed -- yeah, first we did firmware

13   design and system design, and later on did RTL design.

14   Q.    Okay.  And did there come a point in time where Aware

15   left that business?

16   A.    Yeah.  I think after I was gone, though.

17   Q.    Okay.

18   A.    They're not doing it anymore.

19   Q.    And did any of those chip designs use any of the ideas of

20   the claims of the '686 Patent?

21   A.    I don't know that.

22   Q.    Do you know if any Aware product or design ever used any

23   of the ideas claimed in the '686 Patent?

24   A.    I don't know that.

25   Q.    Do you know if anyone outside of Aware has ever used the
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1   ideas claimed in the '686 Patent?

2   A.   You know, I don't -- it was a long time ago. I don't

3   remember the exact -- the exact thought process that led to

4   the patent.

5   Q.   Do you know what the '686 Patent is all about?

6   A.   I believe it's the -- the exchange of diagnostic

7   information between -- across the -- across the DSL interface.

8   Q.   So you believe that you were the first to come up with

9   the idea of transmitting diagnostic information across the DSL

10   transmission line?

11   A.   It was a pretty new standard, so yeah.

12   Q.   If you could open up the patent to claim 36, please. It

13   will be starting on the second to last page and it goes into

14   the last page. Take your time. Just let me know when you're

15   there, sir.

16   A.   Okay.

17   Q.   And do you see --

18   A.   Claim 36. An information storage media comprising

19   instructions. That one?

20   Q.   Yes, sir.

21   A.   Is that the one we're looking at? Okay.

22   Q.   Okay. Why don't you take a moment and just read claim 36

23   to yourself.

24   A.   Okay.

25   Q.   Can you describe for me what claim 36 is all about?

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1    A.    Well, I think it's -- it's talking about exchanging

2    information on the -- the -- the characteristics of the line.

3    Q.    Okay.   One -- one aspect of this claim is idle channel

4    noise information.   Do you see that, sir?

5    A.    Yeah.   Yes.

6    Q.    Okay.   Did you invent the concept of idle channel noise

7    information testing?

8    A.    Probably not.   Sorry.

9          Yes.

10   Q.    And the REVERB1 signal and the SEGUE1 signal were mapped

11   to one bit, again prior to you filing the application that led

12   to the '686 Patent.   Is that right?

13   A.    Yes.

14   Q.    Okay.   At the top of column 4, there's something that's

15   labeled table 1.   Do you see that, sir?

16   A.    Yes.

17   Q.    And can you identify for me those which you believe were

18   standard parameters at the time of the application that led to

19   the '686 Patent?

20   A.    Not really.   You know, signal-to-noise ratio obviously

21   would be one.

22   Q.    What about average idle channel noise?   Was that a

23   standard known parameter before the application of the '686

24   Patent?

25   A.    Yeah.   I mean, channel noise is -- is something that
```

1   people talked about. You know, I don't know if -- I don't

2   think it was part of the standard, if that's -- if that's the

3   question.

4   Q.   I'm not necessarily asking about the standard, sir. I'm

5   just trying to figure out what --

6   A.   -- you're saying standard -- I think these are

7   generally -- are mostly general parameters in -- in

8   communication systems.

9   Q.   Okay. So regardless of whether it had been ratified in a

10   standard, the concept of measuring idle channel noise

11   information was known to -- to someone in the art before you

12   filed the application that led to the '686 Patent. Is that

13   fair?

14   A.   I'd say probably.

15   Q.   Do you know what TQ Delta does for a business?

16   A.   Not exactly.

17   Q.   As somebody --

18   A.   I guess they have these -- I guess they have these

19   patents.

20   Q.   As somebody who's in the industry working on modems, do

21   you view TQ Delta as a competitor?

22   A.   No.

23   Q.   So if it's the case that TQ Delta has licensed the '686

24   Patent for money to other companies, they never paid you a

25   penny of those -- those licensing fees. Is that correct?

1   A.   That's correct.

2   Q.   Did you win any awards for the ideas that led to the '686

3   Patent?

4   A.   No.

5   Q.   Did you give any speeches relating to the ideas that were

6   claimed in the '686 Patent?

7   A.   I don't think so, no.

8   Q.   Did you publish any papers regarding the ideas that led

9   to the '686 Patent?

10   A.   No.

11   Q.   Okay. So putting aside with respect to the lawsuits that

12   TQ Delta has -- has filed, putting those aside for a moment,

13   has anyone else outside of the company ever come up to you and

14   said, hey, I'd like to discuss the '686 Patent with you?

15   A.   No.

16   Q.   Do you know whether the '686 Patent has ever been the

17   subject of any sort of industry recognition or industry

18   praise?

19   A.   No.

20   Q.   Do you have any sense as to whether the ideas disclosed

21   in the '686 Patent have ever been commercialized by anybody?

22   A.   I don't know.

23   Q.   Are you proud of the work that you did that led to the

24   '686 Patent?

25   A.   Somewhat.

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1    Q.   You know, in your career working in modems and

2    semiconductors, do you believe that the idea that led to the

3    '686 Patent is a highlight of your career?

4    A.   No, I wouldn't -- I wouldn't go that far.

5    Q.   Just to make sure I have your earlier testimony correct,

6    you believe that you invented the concept of sending

7    diagnostic information over a DSL line?

8    A.   Yes.

9    Q.   And is that belief one of the reasons that you filed the

10   application that led to the '686 Patent?

11   A.   Yes.

12   Q.   Are you aware of any claim construction order that's been

13   entered by Judge Gilstrap in this case?

14   A.   No.

15   Q.   Have you ever read a claim construction order entered by

16   Judge Gilstrap in this case?

17   A.   No.

18             THE COURT:  Does that complete this witness by

19   deposition?

20             MR. STEVENS:  It does, Your Honor.

21             THE COURT:  Am I correct you have one more

22   deposition witness?

23             MR. STEVENS:  That is correct, Your Honor.

24             THE COURT:  Let's present this deposition witness to

25   the jury, please.
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1   MR. STEVENS: The next witness is Raphael Cassiers.

2   He's an employee of Broadcom.

3   And the time is 3 minutes and 45 seconds to CommScope and

4   36 seconds to TQ Delta.

5   THE COURT: Let's proceed with this witness by

6   deposition, please.

7   MR. STEVENS: Thank you, Your Honor.

8   RAPHAEL CASSIERS, BY SWORN DEPOSITION,

9   Q.   Good morning, Mr. Cassiers. Could you please state and

10   spell your name for the record?

11   A.   So I'm Raphael Cassiers, R-A-P-H-A-E-L, C-A-S-S-I-E-R-S.

12   Q.   And -- and once that is completed, once the pseudorandom

13   number has modified the bits in the MODPAT variables, again,

14   there's still no phase associated with those modified bits at

15   this point in time. Is that correct?

16   A.   Yes. At this point in time, we are just preparing data

17   that are going to be encoded according to the modulation

18   scheme and then transformed to an XY variable later on. At

19   this point, we are just manipulating data bits that are going

20   to be later on input to that modulator.

21   Q.   So I'd like to -- to change gears. And I'd like to talk

22   a little bit about your discussion with counsel for TQ Delta

23   regarding loop diagnostic mode. Do you recall discussing that

24   with him a few minutes ago?

25   A.   Yes.

1   Q.   Okay. And I believe that you said that that is a feature

2   that's rarely used in the real world?

3   A.   That's my understanding, to the best of my knowledge.

4   Q.   Okay. So, again, just to summarize those reasons, reason

5   one is that it's very slow and takes a long time to do loop

6   diagnostic mode. Is that right?

7   A.   Yes.

8   Q.   Number two is it's not well-tested interoperability. In

9   fact, at the University of New Hampshire interoperability

10   tests, that's not even tested?

11   A.   I wouldn't swear on that, but I don't believe that it is

12   being tested.

13   Q.   And the third drawback to loop diagnostic mode is that

14   because you haven't tested it much, it could actually be less

15   robust than other initialization modes. Is that correct?

16   A.   Yes.

17   Q.   Okay. Now, if I heard you correctly, in order to run a

18   quiet line noise test, you don't have to be in loop diagnostic

19   mode. Is that right?

20   A.   That's correct.

21   Q.   You could get that same information, the quiet line noise

22   information, in other modes that are not the loop diagnostic

23   mode. Is that right?

24   A.   Yes, that's correct.

25   Q.   And there would be nothing different about the results of

1   a quiet line noise test whether you were in loop diagnostic

2   mode or a completely different mode. Is that fair?

3   A.   That's correct.

4   Q.   And the way that -- well, within loop diagnostic mode,

5   the CPE will gather the quiet line noise information and then

6   the CPE will send that to the central office side. Is that

7   correct?

8   A.   Yes.

9   Q.   And then the central office side can report that up to

10 the user interface, or the HMI. Is that right?

11 A.   Yes.

12 Q.   And that is how quiet line testing is transferred from

13 the CPE to the CO within loop diagnostic mode. Correct?

14 A.   Yes, that's correct.

15 Q.   Now, you also discussed with Mr. McAndrews earlier the

16 concept of ROC. Do you recall that?

17 A.   Yes.

18 Q.   And, again, it's up to the customer ultimately whether to

19 use different SNR margins. Is that right?

20 A.   That's correct.

21 Q.   There's nothing about the Broadcom chipset that requires

22 that to happen. Is that correct?

23 A.   That's correct.

24 Q.   So if a customer decides to set the SNR margin to zero,

25 then there will not be multiple SNR margins used. Is that

1   right?

2   A.   That's correct.

3   Q.   Okay.   In each one of those three equations, the memory

4   will be set greater than I minus 1 times D minus 1 over 2.   Is

5   that correct?

6   A.   Yes, that's correct.

7   Q.   So the I minus 1 times D minus 1 over 2, that's the

8   theoretical minimum.   Correct?

9   A.   Yes.

10   Q.   And Broadcom always sets the actual memory allocation

11   above that theoretical minimum.   Correct?

12   A.   Yes.

13   Q.   Okay.

14   THE COURT: Does that complete that witness by

15   deposition?

16   MR. BARTON: It does, Your Honor.

17   THE COURT: I didn't hear the 36 seconds of counter

18   time, but I guess it played.

19   MR. BARTON: It did.

20   THE COURT: It's all there.

21   MR. BARTON: It is.

22   THE COURT: Okay.   All right.   That completes your

23   remaining deposition witnesses prior to our next live witness.

24   Is that correct, Mr. Barton?

25   MR. BARTON: That is correct, Your Honor.

1   THE COURT: Okay. Then this is a good juncture,

2   ladies and gentlemen, for a recess. If you'll simply close

3   your notebooks, leave them in your chairs, follow all my

4   instructions, and we'll be back shortly to continue with a

5   live witness from the witness stand.

6   The jury's excused for recess at this time.

7   (Whereupon, the jury left the courtroom.)

8   THE COURT: Court stands in recess.

9   (Brief recess.)

10   THE COURT: Be seated, please.

11   Let me remind those in the gallery, during the recess one

12   of the Court Security Officers let me know that they had heard

13   a cell phone. I didn't hear it, so I'm not going to do

14   anything about it, but you're not permitted to have devices

15   that sound, ring, or interrupt or disrupt the proceedings of

16   the court.

17   And if something like that happens again and I'm aware of

18   it, my typical response is to have the device confiscated. So

19   be sure if you have a device that can make a noise on your

20   person, that it's either turned off or silenced. All right?

21   Are we prepared to take the next Defense witness?

22   MR. BARTON: Yes, Your Honor.

23   THE COURT: Let's bring in the jury, please.

24   (Whereupon, the jury entered the courtroom.)

25   THE COURT: Welcome back, ladies and gentlemen.

1   Please have a seat.

2   Defendants call your next witness.

3   MR. BARTON: Your Honor, CommScope calls Dr. Niel

4   Ransom.

5   THE COURT: All right. Doctor Ransom, if you'll

6   come forward and be sworn by the Courtroom Deputy, please.

7   (Whereupon, the oath was administered by the Clerk.)

8   THE COURT: Thank you, sir. Please come around,

9   have a seat on the witness stand. Take a moment to adjust

10   your chair and the microphone. If you need to pour a glass of

11   water, feel free to do, and then we'll proceed.

12   All right. Counsel, you may proceed with direct

13   examination.

14   MR. BARTON: Thank you, Your Honor.

15   MAURICE NIEL RANSOM Ph.D., SWORN,

16   having been duly sworn, testified under oath as follows:

17   DIRECT EXAMINATION

18   BY MR. BARTON:

19   Q.   Good afternoon, Doctor Ransom.

20   A.   Good afternoon.

21   Q.   Can you please state your full name for the record?

22   A.   My name is Maurice Niel Ransom.

23   Q.   And Doctor Ransom, can you tell us a little bit about

24   yourself, please?

25   A.   Well, I live near Raleigh, North Carolina, with my wife.

1   We have four kids, two of which live nearby, and we have six

2   grandkids, two of which live in Texas.

3   Q.   All right. Now, did you prepare some demonstratives that

4   help outline your testimony today?

5   A.   Oh, yeah, I have.

6   Q.   Okay. Doctor Ransom, can you tell us a little bit about

7   yourself, starting with where you went to school?

8   A.   Well, let's see. I got my Bachelor's and Master's

9   degrees in electrical engineering from Old Dominion

10   University, which is in Virginia. I got a Ph.D. from the

11   University of Notre Dame in 1973, and I also have an MBA from

12   the University of Chicago.

13   Q.   And what is an MBA?

14   A.   A Master's of business administration.

15   Q.   All right. Now, Doctor Ransom, are you familiar with DSL

16   technology?

17   A.   Oh, yes, I am.

18   Q.   And where does your familiarity come from?

19   A.   Well, I've been in telecommunications since the 1970s,

20   and I was one of the leaders in the industry that pushed DSL

21   forward as it was being developed.

22   Q.   So are you someone that's been in that telecommunications

23   and DSL industry your entire professional career?

24   A.   Yes, I have.

25   Q.   All right. Let's take a step back, and can you tell us

1   about your first job in the industry?

2   A.   Well, let's see. After I got my Ph.D., I joined Bell

3   Labs as a member of the technical staff.

4   Q.   And who's Bell Labs?

5   A.   Well, Bell Labs is probably the most premier technology

6   company over the last -- hundred years, especially in

7   telecommunications. Numerous Nobel prize winners have come

8   out of Bell Labs.

9   Q.   Who is the Bell of Bell Labs?

10   A.   That is Alexander Graham Bell.

11   Q.   And who is he?

12   A.   He was the inventor of the telephone.

13   Q.   Okay. And what did you do when you were at Bell Labs?

14   A.   Well, I did research and development of advanced

15   telecommunication products and -- and services, including

16   broadband services to the home.

17   Q.   And as part of your employment at Bell Labs, were you

18   able to attend ITU meetings?

19   A.   Yes, I did.

20   Q.   What did you do after Bell Labs?

21   A.   Well, after Bell Labs, I joined BellSouth as the director

22   of the Advanced Technology Systems Center.

23   Q.   And what did you do at BellSouth?

24   A.   Well, the organization I ran wrote detailed technical

25   specifications and laboratory testing of new products before

1   we put them into the BellSouth network.

2   Q.   Did you do any DSL work while you were at BellSouth?

3   A.   Yes. We were very focused on DSL and fiber to the home.

4   Q.   And where did you work after BellSouth?

5   A.   After BellSouth, I worked for Alcatel.

6   Q.   Can you tell the jury a little about Alcatel, please?

7   A.   Well, Alcatel was one of the largest telecommunications

8   equipment companies in the world, especially in -- in -- in

9   DSL.

10   Q.   And roughly when were you at Alcatel?

11   A.   Let's see. I joined Alcatel in 1997, until 2005.

12   Q.   And what did you do while you were at Alcatel?

13   A.   Well, initially I was general manager of Alcatel's ADSL

14   business in -- in North America and eventually became the

15   corporate CTO of the company.

16   Q.   And what does CTO stand for?

17   A.   Chief technology officer.

18   Q.   And as the chief technology officer at Alcatel, how many

19   people did you oversee?

20   A.   Well, I had a little over 1200 people in my CTO group.

21   Q.   All right. And while at Alcatel, were you involved in

22   standards organizations?

23   A.   Oh, yeah. The Alcatel standards development department

24   reported to me.

25   Q.   And what have you done since you left Alcatel in 2005?

1   A.   Well, I've been now working with high technology

2   start-ups and some public companies, typically on the boards

3   of directors.

4   Q.   Do you have any patents or publications?

5   A.   Yes. I have six patents, and I also wrote a book on

6   broadband access technology published by McGraw-Hill.

7   MR. BARTON: Your Honor, at this point I would move

8   that Doctor Ransom be admitted as an expert in the field of

9   telecommunications and the subject matter of the asserted

10   patents.

11   THE COURT: Is there objection?

12   MR. HURT: No objection, Your Honor.

13   THE COURT: Without objection, the Court will

14   recognize this witness as an expert in those designated

15   fields.

16   Please continue, counsel.

17   MR. BARTON: Thank you, Your Honor.

18   Q.   (BY MR. BARTON) Now, Doctor Ransom, going back to the

19   early 2000s, who were the major industry players in the DSL

20   industry at that time?

21   A.   Well, at that time Alcatel was by far the largest

22   supplier of DSL equipment, but there was also others like

23   Siemens, Lucent, WesTel, Adtran, Huawei; and then, of course,

24   the chip suppliers like Infineon, Texas Instruments, Motorola,

25   and Amati.

1   Q.   And at that time in early 2000s, had you heard of a

2   company called Aware?

3   A.   Yeah, I'd heard of them.

4   Q.   And what was your understanding of what Aware was doing

5   at that time?

6   A.   Well, they were working on DSL chips.

7   Q.   Did you ever do business with Aware while you were at

8   Alcatel?

9   A.   No, no, not really.

10   Q.   Why not?

11   A.   Well, they were a small company. We were working mostly

12   with the large dominant players in the market.

13   Q.   Okay. Now, Doctor Ransom, what were you asked to

14   evaluate in this case?

15   A.   I was asked to evaluate whether the accused products of

16   CommScope infringed three specific patents.

17   Q.   And what conclusions were you able to draw regarding the

18   three patents which we see here as the '881, '048, and '411

19   Patents?

20   A.   Yeah. I was able to conclude that the products do not

21   infringe any of those three patents.

22   Q.   Okay. Before we go into the claims of the patents, I

23   want to ask you some questions about the components TQ Delta

24   has accused in these products. Is that okay?

25   A.   Sure.

1   Q.   All right. So what are you showing here, Doctor Ransom?

2   A.   Well, this is a DSL modem. It shows the main circuit

3   board for that and also shows the Broadcom SOC, which is sort

4   of the heart of the device.

5   Q.   And we'll turn to the Broadcom SOC in a second. Is this

6   what Doctor Cooklev focused on for his infringement analysis

7   for all three of the patents you are testifying about today?

8   A.   Yes, it is.

9   Q.   And did Doctor Cooklev point to any CommScope source code

10   in his infringement analysis in your recollection?

11   A.   No, I don't recall him ever mentioning any CommScope

12   source code.

13   Q.   Okay. So you used the phrase Broadcom SOC. What is an

14   SOC?

15   A.   Well, it's a technique where a chip designer will take

16   the processor, the memory, all the software, and other

17   circuits and put it together on one big, self-contained

18   system-on chip.

19   Q.   And do most DSL chipsets function in that way?

20   A.   Yeah, they do.

21   Q.   Okay. Now, Doctor Ransom, were you able to conduct a

22   comparison of the technological capabilities of that Broadcom

23   chip with one of the Lantiq chips we've heard about?

24   A.   Yeah, I did that.

25   Q.   And turning to slide 5, what Broadcom and Lantiq chips

1   did you compare?

2   A.   Well, I compared the Lantiq VRX288 with the Broadcom

3   63168.

4   Q.   And how did you do that comparison?

5   A.   Well, I took the detailed data sheets of both products

6   and compared their advertised capabilities.

7   Q.   What's a data sheet?

8   A.   A data sheet is something the manufacturer puts out that

9   details all the various features that are in the product.

10   Q.   Okay. And based on that comparison that you performed,

11   what's your opinion regarding the technical comparability of

12   that Lantiq VRX288 with the Broadcom chips?

13   A.   Yeah. They look very comparable. They supported the

14   same standards. It looked like either one could be used to

15   build a DSL modem.

16   Q.   Okay. All right. Let's turn to your opinions on the

17   patents. Is that okay?

18   A.   Sure.

19   Q.   All right. Looking here at slide 6, what are you showing

20   here?

21   A.   This is the '881 Patent.

22   Q.   And at a high level, what technology is the '881 directed

23   toward?

24   A.   Well, it's talking about sending data over multiple DSL

25   lines using a technique called bonding.

1   Q.   What is a bonded line or bonding?

2   A.   Well, the phone lines that we have to the house were very

3   limited and are very limited on trying to send high speed

4   data. Now, there's some homes that actually have more than

5   one line, like maybe they got a line for the teenager or

6   something, so there might be two lines, in which case it's

7   possible to send the data over both lines and have what looks

8   like a double-speed DSL line.

9   Q.   Was the concept of bonding new at the time of the '881

10   Patent?

11   A.   Oh, no. Well-known.

12   Q.   Did you have any involvement in developing bonding

13   techniques?

14   A.   Yeah, I was involved in what was called inverse

15   multiplexing over ATM which was a type of bonding.

16   Q.   And, roughly, when did that take place?

17   A.   It came out by the ATM form in 1997.

18   Q.   Okay. So looking at your ultimate opinion, what is your

19   opinion as to whether CommScope's products infringe the '881

20   Patent?

21   A.   Well, it was my conclusion, as I stated, that these

22   products do not infringe this patent.

23   Q.   And can you explain your reasoning for the jury?

24   A.   Well, there's two reasons. One, this capability isn't

25   mandatory. It's an optional capability, so you don't have to

1   implement it. And then looking at the specific claim

2   language, it -- it talks about reducing a difference in

3   latency which was very different than the controlling latency

4   that the standard itself talked about.

5   Q.   Looking at this next slide, Doctor Ransom, is this the

6   claim language you evaluated?

7   A.   Yes, it is.

8   Q.   And what are you showing here in highlighting?

9   A.   Well, I highlighted the part that I thought was very

10   relevant here. It says, "Utilizing at least one transmission

11   parameter value to reduce a difference in latency."

12   Q.   Okay. And do you understand that Doctor Cooklev pointed

13   to the ITU G.bond standard in connection with this '881

14   Patent?

15   A.   Yes, he did.

16   Q.   Okay. How does the ITU G.bond standard describe this

17   requirement?

18   A.   Well, actually the G.bond standard doesn't directly

19   detail it, but rather it includes by reference an IEEE

20   standard on this.

21   Q.   And what IEEE standard is that?

22   A.   It's called the 802.3ah.

23   Q.   Okay. And looking at that 802.3ah standard, does the

24   IEEE standard require the functionality described in the claim

25   of the '881 Patent?

1   A.   Well, what it says, and this is very important, it says,

2   "Therefore, it is logical that multiple aggregated links in

3   the same environment should be optimized to have similar

4   latencies."

5   Q.   Why is the word 'should' important?

6   A.   Well, it's a keyword. It's used in this standards

7   defined in the style guide. You've heard earlier this week

8   people quote things that said 'shall' and say, Ahh, that means

9   it's a hard requirement. And that's true.

10   As word usage is defined here, it says that the 'shall'

11 will indicate a mandatory requirement. So it says if it shall

12 do it, then it's a mandatory requirement.

13   Should is used to say, well, there's multiple

14 possibilities. One is recommended as particularly suitable

15 without mentioning or excluding others. So if you say should,

16 well, you can do any of those.

17 Q.   Is what we're looking at on slide 12 here the language of

18 the 802.3ah standard that is Exhibit 26?

19 A.   Well, the standard as we just showed it used the word

20 'should'.

21 Q.   Got it.

22   Okay. So is it your opinion then that the ITU and IEEE

23 standards did not require controlling latency in the first

24 place?

25 A.   Yeah, that's correct.

1   Q.   Okay. So looking at the claim versus the standard, can

2   you describe what you're showing here on this slide for us?

3   A.   Yeah. I compared the language in the claim and -- and

4   the language that's part of this standard, and the standard

5   talks about controlling maximum latency difference,

6   controlling it, and the claim said that you will reduce a

7   difference in latency.

8   Q.   Now, did the Court construe the term 'reduce a difference

9   in latency'?

10   A.   Yes, it did. Yes, the Court did.

11   Q.   And how did the Court construe that term?

12   A.   Well, they construed it to mean reduce a difference in

13   configuration latency between the bonded transceivers.

14   Q.   Okay. Now, turning back to the standard, what does the

15   standard require?

16   A.   Well, the standard requires an ability to control this

17   latency difference.

18   Q.   And in a DSL system, how would someone control latency?

19   A.   Well, the way we would deploy this at BellSouth and, of

20   course, I was working closely with AT&T, when we would do

21   bonding, we would make sure that both of the pairs were from

22   the same binder group.

23   Q.   What's a binder group?

24   A.   Well, the phone lines that we bring to the house are in

25   these big cables, and they might have 500 pairs in them. And

1   we use color codes to tell the wires apart, but we don't have

2   that many colors. So we would take groups of 25 and put a

3   ribbon around it, called a binder group, and then if we are

4   serving some homes down the street, we take one of those

5   binder groups, connect it to the homes, and if a home had two

6   lines, then it would get both lines from the same binder

7   group.

8   Q.   And how does selecting two lines from that same binder

9   group help control latency?

10   A.   Well, the two -- two lines --

11   MR. HURT: Objection, Your Honor. May I approach?

12   THE COURT: Approach the bench.

13   (The following was had outside the hearing of the

14   jury.)

15   THE COURT: What's your objection, Mr. Hurt?

16   MR. HURT: Your Honor, this is outside the scope of

17   Doctor Ransom's report. There wasn't anything in his report

18   on the controlling latency related to how he deployed it at

19   BellSouth or AT&T or how they controlled latency at BellSouth

20   or AT&T. None of that information is in his -- his report,

21   Your Honor.

22   THE COURT: What's your response, Mr. Barton?

23   MR. BARTON: I believe -- I believe this is 50 and

24   145 of his report.

25   THE COURT: Which paragraph?

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 1            MR. BARTON:  50 and 145.  Look at the last sentence

 2   in particular of paragraph 145.

 3            THE COURT:  The question is, How does selecting two

 4   pairs from the same binding group control latency, and Mr.

 5   Barton's referencing paragraphs 50 and 145 of the expert's

 6   reports.  How do you believe that there is no support here for

 7   that question?

 8            MR. HURT:  Your Honor, paragraph 50 --

 9            THE COURT:  Of course, it's a question that's asked

10   without an answer so we don't know what his answer's going to

11   be.

12            MR. HURT:  Well, the answer to that question, I did

13   not see in his report the discussion that this binder group

14   wasn't about AT&T or how it works.  I mean, this is a cursory

15   sentence without the detail of the basis of his opinion.  And

16   I don't believe that 50 speaks to that, either, Your Honor,

17   because it just mentions --

18            THE COURT:  Let me ask Mr. Barton to weigh in on

19   this.

20        Where is it you think in these paragraphs there's support

21   for the question as asked?

22            MR. BARTON:  Certainly.  So in paragraph 50, he is

23   talking about carriers such as AT&T using multiple loops

24   selected from a binder group.  He then indicates that both

25   loops would thus be the same length and subject to the same
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1   impairments with the result that both loops would initialize

2   with nearly the same, if not identically same, data rate;

3   hence, the use of the accused product by AT&T and other

4   carriers, no actions to reduce differential delay such as

5   purposely slowing down the speed of the faster of the two

6   bonded lines would take place. That is direct disclosure.

7   THE COURT: No actions to reduce differential delay

8   would take place. I think the question was how does selecting

9   the two from the same binder group control --

10   MR. BARTON: And the answer is because they are the

11   same length, they would have the same impairments and thus the

12   same latency.

13   THE COURT: Okay. Well, the impediment the Court

14   has is that the witness has been asked a question and hasn't

15   been afforded an opportunity to answer it yet. I'm going to

16   let him answer the question. But if his answer goes beyond

17   what's in paragraphs 50 and 145, then I expect you to raise

18   this objection again, Mr. Hurt. Okay?

19   MR. HURT: Thank you, Your Honor.

20   MR. BARTON: May I go to counsel table and look at

21   the question I asked?

22   THE COURT: Sure. Go ahead and look at it.

23   MR. BARTON: Thank you.

24   (The following was had in the presence and hearing

25   of the jury.)

1   THE COURT: If you will, Mr. Barton, restate the

2   question to the witness, please.

3   MR. BARTON: Certainly.

4   Q.   (BY MR. BARTON) So, Doctor Ransom, before that, the

5   question was how would selecting two different set of wires

6   from the same binder group control latency?

7   A.   Right. Well, if both wires came out the same binder

8   group, then the two wires would end up being the same length,

9   it would be made out of the same kind of material, and, more

10   importantly, any noise or anything that happened along the way

11   that might interfere would affect both of them equally so the

12   net result is that the latency of the two -- the difference in

13   latency of the two would be controlled.

14   Q.   Okay. So Doctor Ransom, with that background, in the

15   instance where you actually do encounter latency, what would

16   you need to do in order to reduce a difference in latency in a

17   DSL system?

18   A.   Okay. So if you had two lines, one would with much more

19   latency than the other, then you could add additional latency

20   to the one that's less so that the difference between the two

21   would be less --

22   Q.   And why would you --

23   A.   -- and would be reduced.

24   Q.   Excuse me. Why would you want to do that?

25   A.   Well, if you had a very high speed and a very low speed

1   line, then it's possible that you could get lots of packets

2   down the fast one before you ever got the first one down the

3   slow one which would complicate putting them back together in

4   the right order.

5   Q.   So, with that in mind, can you explain for the jury the

6   difference between controlling and reducing latency?

7   A.   Well, if you have control over the latency difference, if

8   you can set it up through techniques like I just described,

9   then you can control the difference in latency.

10   Reduce means you need to change something. It used to be

11   something, and you didn't like it, so you changed it and now

12   it's reduced. So there's kind of a before and after.

13   Q.   Did you have an analogy to help the jury understand this?

14   A.   Well, yes. I drew something I hope that comes over well.

15   I was thinking of a speed limit. So if you have a difference

16   in speeds of cars on the highway, you might not like that. It

17   creates some issues. So what you could do is reduce the

18   speed. So the speed used to be one amount and now it's

19   different, it's -- it's reduced.

20   Q.   And how would using that analogy one control?

21   A.   Well, in control it's different. And so you'll see this

22   along the interstate where they have kind of a maximum speed

23   and a minimum speed. So there you're controlling the

24   difference in speeds of the cars. You haven't changed

25   something, you haven't reduced what used to be. Instead, you

1   set it up so that that difference is controlled.

2   Q.   Okay.   Looking back at the claims, do CommScope's

3   products reduce a difference in latency as claimed in the '881

4   Patent or do they control latency as described in the

5   standard?

6   A.   They -- they control latency as per the standard.

7   Q.   And why is that important to your non-infringement

8   position?

9   A.   Well, because the claim language was very specific.   It

10   said that the product had to reduce a difference in latency.

11   Q.   All right.   So can you summarize for the jury your

12   opinions on the '881 Patent?

13   A.   Well, my conclusion was that the CommScope products don't

14   infringe the '881 Patent.

15   Q.   Okay.   Let's turn to the next patent, which is the '048

16   Patent.   And can you describe at a high level what this patent

17   relates to?

18   A.   Sure.   This relates to setting up the interleavers and

19   deinterleavers in a -- a DSL network.

20   Q.   Okay.   And this is claim 5 of the '048 Patent.   And

21   you've highlighted some claim limitations here.   Can you --

22   can you explain to us what you've highlighted?

23   A.   Sure.   These are ones that I thought were particularly

24   relevant.   It describes having a message during initialization

25   that would specify a maximum number of bytes of memory that

1 are available to be allocated to a deinterleaver.

2 Q.   Okay. And so can you tell us what portions of this claim

3 CommScope does not do?

4 A.   Well, per the standard, there is no such message. There

5 is no such message that's sent during the initialization

6 specifying a maximum number of bytes of memory that are to be

7 allocated. And then, of course, the second claim element that

8 then talks about doing the allocated memory to make sure that

9 it didn't exceed the number of bytes specified in the message,

10 but since there is no such message, then it doesn't do that,

11 either.

12 Q.   Now, do you recall Doctor Cooklev pointing to a

13 particular ITU standard in his infringement analysis of

14 this --

15 A.   Absolutely. The GDS -- I'm sorry.

16 Q.   And what standard was that, sir?

17 A.   It was the VDSL2 standard. It's very high speed DSL

18 version 2.

19 Q.   And in your opinion, Doctor Ransom, does VDSL2 disclose a

20 message that specifies a maximum amount of memory?

21 A.   Well, no, it does not.

22 Q.   Okay. Before we talk about VDSL2, can we take a step

23 back and -- and cover a little bit of background? Is that

24 okay with you?

25 A.   Sure.

1   Q.   All right. Before VDSL2, was there another VDSL

2   standard?

3   A.   Yes, there was. We called it VDSL, the first original

4   standard that came out, VDSL. But it wasn't very popular,

5   never got deployed. So then we had a new and improved and

6   much changed one, VDSL2, and now we kind of refer to the first

7   one as VDSL1.

8   Q.   Okay. And in your opinion, Doctor Ransom, does VDSL1

9   describe a message that specifies a maximum amount of memory?

10   MR. HURT: Objection, Your Honor. May we approach?

11   THE COURT: Approach the bench, counsel.

12   (The following was had outside the hearing of the

13   jury.)

14   MR. HURT: Objection, Your Honor. This is outside

15   of Doctor Ransom's report.

16   THE COURT: All right. Just for the record, the

17   earlier objection at the same type raised by Plaintiff was

18   overruled which is why I allowed the question to be re-asked

19   and answered without further interruption, but let's go over

20   this situation.

21   MR. HURT: The question here is, is it Doctor

22   Ransom's opinion VDSL1 and 2 standard specified a message with

23   a maximum amount of memory. That opinion is nowhere in Doctor

24   Ransom's report.

25   I think what you'll hear is that in the background

1   section of paragraph 52, he incorporated the background

2   section of Doctor Wesel's invalidity report. And in that

3   invalidity report section, which is about a hundred pages,

4   there is a discussion of VDSL1. But this is for background,

5   and counsel asked Doctor Ransom if in his opinion --

6   THE COURT: It's for invalidity, and this is

7   testimony going to infringement?

8   MR. HURT: Correct, Your Honor.

9   THE COURT: What's your response, Mr. Barton?

10   MR. BARTON: So Doctor Ransom indicated in his

11   report that he was incorporating Doctor Wesel's --

12   THE COURT: You're showing me the same section Mr.

13   Hurt has shown?

14   MR. BARTON: Background of the technology. And I

15   established with the witness that I'm asking him these

16   questions for purposes of background of the technology so we

17   develop how we got to the standard that they are now accusing

18   of infringement.

19   I will walk the witness through a non-infringement

20   analysis with respect to only the VDSL2 standard. But I

21   wanted to establish how we got to that VDSL2 standard by

22   walking through VDSL1 and a Texas Instruments contribution.

23   Those are -- as Mr. Hurt indicated, those are most certainly

24   explicitly in Doctor Wesel's report in the portion

25   incorporated by reference by Doctor Ransom for purposes of

1   background of the technology.

2   So I'm using it for the exact purpose that we indicated

3   we would be using it or he would be relying on that opinion in

4   his report.

5   THE COURT: Well, I take it you don't contest the

6   issue that Doctor Wesel's opinion was offered in the context

7   of an invalidity analysis and not a non-infringement analysis.

8   MR. BARTON: I do not contest that issue, Your

9   Honor. However, the --

10   THE COURT: The problem I have is that the line

11   between background and non-infringement can sometimes be very

12   thin if, in fact, existent at all. And I'm not sure how the

13   Court's going to police where the background stops and the

14   attempt in Doctor Wesel's report to show invalidity, which is

15   not what this witness is on the witness stand for --

16   MR. BARTON: I understand.

17   THE COURT: -- takes place. I don't know how I

18   police that.

19   MR. BARTON: So here's what I would say, Your Honor.

20   First of all --

21   THE COURT: There are a lot of sins that get cloaked

22   in the language of "background only, Your Honor."

23   MR. BARTON: I understand. But this is not an

24   instance where we're trying to sneak in prior art references

25   through background, which I know is one of -- a huge problem

1   Your Honor encounters.

2   This is a situation where Doctor Wesel went first. In

3   his expert report, he laid out background of the technology.

4   This witness in his report explicitly said, I'm going to rely

5   on that background of the technology for background purposes,

6   and that's what he's testifying about to today.

7   We're not trying to back-door in references for prior

8   art. I'm not going to say that this invalidates the patent or

9   is the reason it's not infringed.

10   THE COURT: Well, I don't have the benefit in front

11   of me of Doctor Wesel's report.

12   MR. HURT: I do, Your Honor.

13   THE COURT: Let me ask you this, Mr. Hurt. Is there

14   a clear delineation in your mind within Doctor Wesel's report

15   of where the background starts and stops as opposed to where

16   his invalidity analysis starts and stops?

17   MR. HURT: Yes, there is in terms of section

18   headings, and this section is a background section. It's

19   about a hundred pages.

20   THE COURT: That's a lot of background.

21   MR. HURT: Yes. And this is about five paragraphs

22   within those hundred pages that mention VDSL1 and LPL-31.

23   Doctor Wesel later today will be testifying that those

24   references indeed do invalidate the patent.

25   And so even if this were properly incorporated

1   background, Doctor Ransom still does not offer an opinion that

2   these prior art references meet the limitations of claims

3   which is what counsel just asked Doctor Ransom. And there's

4   no opinion in Doctor Ransom's report that VDSL1 meets the

5   limitation of a claim.

6   THE COURT: I'm not sure that the question asked him

7   whether the products meet the limitations of the claim.

8   MR. BARTON: And that's not what I'm trying to

9   elicit.

10   THE COURT: He's entitled to incorporate another

11   expert's material, and if there is purely background

12   information in that, he's entitled to use it by incorporation.

13   What he's not entitled to do is take background material and

14   turn it into a non-infringement opinion when he doesn't say

15   that in his report.

16   I'm going to let Mr. Barton go forward with this. But if

17   this becomes beyond clear background in the Wesel report, I

18   expect you to raise it again. All right?

19   MR. HURT: Thank you, Your Honor.

20   MR. BARTON: Understood, Your Honor. Thank you.

21   (The following was had in the presence and hearing

22   of the jury.)

23   THE COURT: Let's proceed.

24   Q.   (BY MR. BARTON) All right. Doctor Ransom, before the

25   break there, I'd ask you a question about VDSL1. So I want to

1   refocus us on that. Is that okay?

2   A.   Okay.

3   Q.   And, again, the discussion here is relating to how the

4   language in VDSL2 came about. Do you understand that?

5   A.   Okay.

6   Q.   All right. So what does VDSL1 say about how the memory

7   is to be set?

8   A.   Well, VDSL1, curiously enough, does have a message that

9   talks about the maximum amount of memory to be allocated.

10   Q.   And what are we looking here as Exhibit 52?

11   A.   We're looking at one of the messages is called R-MS2, and

12   it has this field, maximal interleaver memory. So it's

13   actually telling the device the maximum amount of memory it

14   can use.

15   Q.   And is what's shown on the left-hand side of this

16   demonstrative as Exhibit 52 the VDSL1 standard?

17   A.   Yes. That's the VDSL1 standard.

18   Q.   Now, why in VDSL1 would you want to send a message that

19   specifies a maximum amount of memory?

20   A.   Well, VDSL1 had a specific implementation of how you

21   built an interleaver and deinterleaver. It had this

22   specification of how it could be done called a triangular

23   implementation. So since it's already told you how to build

24   it, then it would know how much memory it would take to build

25   such a thing. And so when it wanted to specify the size of

1   the interleaver, it could tell you by saying how much memory

2   the thing would take.

3   Q.   Okay. Let's turn to the next slide, and is this -- is

4   what we're looking at here VDSL2?

5   A.   Yes, this is the VDSL2 standard.

6   Q.   And what does VDSL2 tell us about how we are to handle

7   the same issue?

8   A.   Okay. So now in VDSL2, they completely changed. Rather

9   than saying how much memory you can devote to these

10   interleavers, it says how much delay the interleaver is

11   allowed to insert. It's called max_delay_octet.

12   And it makes it very clear that it's only specifying the

13   delay. How much memory you are going to use to implement

14   this, it has a specific statement. It says, the actual amount

15   of memory is implementation specific--whatever the

16   manufacturers come up.

17   Q.   So expand on that a little bit, if you could, Doctor

18   Ransom. What does implementation specific mean?

19   A.   Well, it means that, that it depends on how you implement

20   that. They're not going to tell you how to implement it.

21   But, you know, different ways to implement it might take

22   different amounts of memory, and that's fine. Just meet this

23   delay criteria.

24   Q.   And what would be the advantage in VDSL2 to specifying

25   delay as opposed to amount of memory?

1   A.   Well, I can tell you that we manufacturers don't like the

2   standards bodies telling us how to build things inside our

3   box. Tell us how to make the interfaces work, make sure it's

4   interoperability, but how we implement it, we have our own

5   tricks that may give us some advantages. Just give us that

6   kind of freedom.

7   Q.   Okay. So understanding that there was a change from

8   VDSL1 to VDSL2, how did that change come about?

9   A.   Well, it's like it happens in anything in these standards

10   bodies--it's all a contribution that's brought in that's

11   suggesting the change that gets discussed and finally adopted.

12   Q.   And what are we looking at here?

13   A.   Well, this is the contribution that was introduced by

14   Texas Instruments, which was on this specific subject.

15   Q.   And what does this Texas Instruments contribution tell

16   us?

17   A.   Well, it tells us that the interleaver complexity should

18   be specified in terms of delay, time delay, not in terms of

19   the amount of memory. So it says get away from the memory

20   let's do it on the time.

21   And it says that the delay, which is in octets, which is

22   like bytes, should meet the minimum requirements in terms of

23   delay and time. So it would specify this delay in octets or

24   in -- in bytes.

25   Q.   So in Exhibit 61, which is shown here on this

1   demonstrative, when it says specified in terms of a time

2   delay, not in terms of an amount of memory, what does that

3   tell you about whether time is the same thing as memory?

4   A.   Well, time isn't the same thing as memory. In fact, it's

5   a change. They're getting away from talking about memory and

6   they're going to instead talk about time.

7   Q.   Okay. Now, before we move on to the claim-by-claim or

8   claim element-by-claim element analysis, I want to be real

9   clear. Did anyone ever end up using VDSL1?

10   A.   No. It ended up being a dead end. It wasn't a good

11   standard and -- and wasn't really adopted.

12   Q.   Is VDSL1 part of VDSL2?

13   A.   No. No. It's a different standard.

14   Q.   So the only thing they have in common are the letters?

15   A.   Pretty much.

16   Q.   Okay. Let's turn to the next exhibit, the next

17   demonstrative. And if we could, Doctor Ransom, let's focus on

18   the claim language. And what is your non-infringement opinion

19   with respect to this claim?

20   A.   Well, the claim, which specified that during

21   initialization there would be a maximum number of bytes of

22   memory that are available for the deinterleaver is not how

23   it's being done in the standard. That was changed and it's

24   not applicable. That message doesn't occur.

25   Q.   And, instead, what is done in the accused products?

1   A.   The accused products follow the standard of having a

2   message that specifies maximum amount of interleaver delay.

3   Q.   Okay. Now, you were here for Doctor Cooklev's testimony,

4   I believe, yesterday or the day before.

5   A.   Yes, I was.

6   Q.   Okay. And what did Doctor Cooklev point to in VDSL2 as

7   meeting this maximum amount of memory limitation?

8   A.   Well, he used this so-called max_delay_octet that's out

9   of the so-called O-PMS message to say that described the

10   maximum amount of memory available.

11   Q.   And did you understand him to say that because delay is

12   expressed in bytes, that it is, in fact, an amount of memory?

13   A.   No, no, no. Time, especially in digital signal

14   processing, we always -- we traditionally use bytes and bits

15   to represent time. It's how we do things, and it has nothing

16   to do with memory.

17   Q.   So the fact that the delay is expressed in octets, does

18   that change your opinion that time is not memory?

19   A.   Not at all. As I say, it's what we do in digital signal

20   processing. We always use bytes and bits to represent time.

21   And it says delay, and the amount of delay would be in bytes,

22   or octets here.

23   Q.   And as a result, is claim 5 of the '048 Patent infringed

24   by CommScope?

25   A.   No.

1   Q.   Are there any other limitations you believe CommScope

2   does not infringe in claim 5 of the '048 Patent?

3   A.   Well, it's the second part that says, "Wherein the

4   allocated memory for the deinterleaver does not exceed the

5   maximum number of bytes specified in the message." Well,

6   there is no such message, and it didn't specify the maximum

7   number of bytes. So this wasn't infringed, either.

8   Q.   And so is the memory in the accused CommScope products

9   ever limited or -- or constrained in these messages?

10   A.   No. Every implementation of interleavers,

11   deinterleavers, I've seen in the Broadcom implementation have

12   all used more memory than specified in this maximal delay.

13   Q.   Now, the claim language says the allocated memory does

14   not exceed the maximum. Do you see that?

15   A.   I see that.

16   Q.   Are you aware of any instances, Doctor Ransom, where the

17   CommScope products actually allocate more memory than what

18   Doctor Cooklev alleges is specified by that max_delay_octet

19   message?

20   A.   Yes. I've seen the studies Nigel Jones did of the --

21   looking at the source code and figured out how much memory

22   would be allocated, and it was -- it exceeded that.

23   In fact, I heard Doctor Yu, who spoke, I guess, by video

24   earlier this week, in referring to that said, you know, that's

25   not what he uses; that it's -- the amount of memory he uses is

1   more than that. If anything, that would be the minimum,

2   according to Doctor Yu.

3   Q.   So do the CommScope products ever meet this limitation?

4   A.   No, they don't.

5   Q.   So where does that leave us with non-infringement?

6   A.   Well, then I conclude that the CommScope products doesn't

7   infringe the '048 Patent.

8   Q.   Okay. Let's turn to the third patent that you're

9   testifying about today. And if we look at this one, this is

10   Exhibit 7, which is the '411 Patent. Do you recognize this?

11   A.   Yes, I do.

12   Q.   And can you just at a very high level describe the '411

13   Patent for us?

14   A.   Well, the '411 Patent talked about packet retransmission,

15   how to fix errors caused by bursts by having the transmitter

16   to keep a copy, and then later on if the receiver doesn't get

17   it right, he can send a new fresh copy.

18   Q.   At a high level do you believe that the CommScope

19   products infringe this claim or this patent?

20   A.   Well, you'd have to look at the patent claims, but I

21   don't believe that the CommScope products infringe this

22   particular patent.

23   Q.   And why not?

24   A.   Well, again, in the claim language, the claim language

25   has elements to it which are not implemented by the CommScope

1   product.

2   Q.   And is that what we're looking at here highlighted in

3   yellow?

4   A.   Yes. Yes. Very much like the previous case, it says,

5   "Wherein the memory is allocated between a transmission

6   function and the interleaving function or retransmission

7   function and an interleaving function and/or the

8   deinterleaving function in accordance with a message received

9   during the initialization of the transceiver."

10   And there is no such message that's defining the memory,

11   and so this is not implemented in the standard.

12   Q.   Now, do you recall that Doctor Cooklev pointed to both

13   the VDSL2 and G.INP standards to demonstrate infringement

14   against this single claim, claim 18 of the '411 Patent?

15   A.   Yes, I do.

16   Q.   Do either of those standards require a specific

17   implementation of an interleaver such that it says or requires

18   an actual allocation of memory?

19   A.   No. In fact, again, in both the VDSL2 and this G.INP

20   standard, it even makes the statement, it talks about a

21   delay_octet and reinforces to make sure that they're not

22   misunderstood that the actual amount of memory used is

23   implementation specific. It's not telling you how much memory

24   to use.

25   Q.   In fact, is this the VDSL2 standard that we're looking at

1   here?

2   A.   This is from the G.INP -- no, G.993.2, right.

3   Q.   Okay. So both G.INP and VDSL2 are implementation

4   specific. What does it mean with respect to this claim?

5   A.   Well, it means that the -- the claim is not infringed.

6   It talked about doing something, having messages that don't

7   exist in the standard.

8   Q.   Okay. Now, looking at the next slide, what was it that

9   Doctor Cooklev pointed to in his infringement analysis?

10 A.   Well, several of the -- the fields, the latency path

11 descriptor and these two max_delay_octets on the downstream

12 side.

13 Q.   Okay. And what is it -- what does the fact that he's

14 pointing to max_delay_octets tell you about how he's reading

15 this?

16 A.   Well, again, he's thinking that that represents memory as

17 opposed to delay, which the standard says it's delay and even

18 says it's not memory. Please, don't get confused.

19 Q.   So we've got the '048 Patent, which we just talked about,

20 and now this is the '411 Patent. Right?

21 A.   Right.

22 Q.   And is it your opinion that the same rationale leads to

23 non-infringement of both?

24 A.   Yes. Yes, it does.

25 Q.   Okay. So in conclusion, Doctor Ransom, what is your

1 opinion regarding non-infringement of the three patents that

2 you opined on here, the '881, '048, and '411 Patents?

3 A.   Yeah.   It's my opinion that the CommScope products do not

4 infringe any one of these three particular patents.

5 Q.   Thank you.

6   MR. BARTON: Pass the witness, Your Honor.

7   THE COURT: Cross-examination by the Plaintiff?

8   MR. HURT: Yes, Your Honor. May we have a moment to

9 pass out the binders?

10   THE COURT: You may.

11   (Pause in proceedings.)

12   THE COURT: All right, Mr. Hurt. Let's proceed with

13 cross-examination.

14   MR. DAVIS: Your Honor, I apologize. We have one

15 more binder to pass out.

16   THE COURT: Okay. I didn't know they were coming in

17 complementary editions.

18   MR. DAVIS: I didn't, either.

19   THE COURT: Those are all the binders?

20   MR. DAVIS: Yes, Your Honor, that's it.

21   THE COURT: All right. Then let's proceed with

22 cross-examination.

23   MR. HURT: Thank you, Your Honor.

24   CROSS EXAMINATION

25 BY MR. HURT:

1   Q.   Doctor Ransom, you and I, I believe, met before when I

2   took your deposition in this case?

3   A.   Oh, yeah, right. Thanks.

4   Q.   I assume I was professional and courteous to you then?

5   A.   You were, in fact.

6   Q.   Okay. I'll try to keep that up today.

7   A.   Okay. Thank you.

8   MR. HURT: Mr. Diaz, if you can pull up Doctor

9   Ransom's slide DDX 3.3. This was the summary of opinions

10   slide.

11   Q.   (BY MR. HURT) Do you remember talking about this on

12   direct examination, sir?

13   A.   Yes, I do.

14   Q.   And you mentioned that you were asked to look at three

15   patents. Is that right?

16   A.   Yes, that's right.

17   Q.   But your expert report in this case actually addressed

18   non-infringement of a fourth patent, didn't it?

19   A.   Yes. There was one other patent I opined in my expert

20   report.

21   Q.   And that was the '835 Patent, or DSL reboot patent, that

22   we heard about yesterday. Right?

23   A.   Yes, that's right.

24   Q.   And you didn't tell the jury anything about that patent

25   today. Right?

1   A.   I wasn't asked so I didn't tell.

2   Q.   And Doctor Madisetti, I think, was on the stand for

3   almost an hour going through that patent element by element by

4   element. Do you remember that?

5   A.   Yeah, I saw that.

6   Q.   And he looked at the standard, the CommScope documents,

7   and the source code. Right?

8   A.   Right. Right.

9   Q.   When did you -- did you decide to -- to not present on

10 the '835 Patent prior to Doctor Madisetti testifying

11 yesterday?

12 A.   That's right.

13   MR. BARTON: Objection. Your Honor, I believe this

14 violates MIL 22 and perhaps MIL 1 as well.

15   THE COURT: The question was, when did the witness

16 decide. If the witness made the decision, then it's not a

17 privileged issue. If there was communication with counsel, it

18 might be. But as posed, it doesn't raise the issue of

19 privilege.

20   Now, if the witness didn't make the decision, doesn't

21 know, it might in a subsequent question. But I'm going to

22 overrule the objection at this point.

23   Do you want to restate the question for the witness. Mr.

24 Hurt?

25   MR. HURT: Yes, Your Honor.

1   Q.   (BY MR. HURT) Did you decide before or after Doctor

2   Madisetti took the stand yesterday on whether you'd be

3   presenting your non-infringement opinions on the '835 Patent?

4   A.   Well, to be clear, I didn't make any of these decisions.

5   I was here as an expert witness, and I responded to what I was

6   asked to present this week.

7   Q.   Okay. Understood.

8   And you testified that you used to work at Nokia. Right?

9   A.   Yes, I worked at Alcatel, which was now merged with

10   Nokia.

11   Q.   Right. And when you were at Alcatel, you headed up their

12   intellectual property division, didn't you?

13   A.   Yes, I did.

14   Q.   And part of that included licensing patents on behalf of

15   Alcatel?

16   A.   Yes, it did.

17   Q.   And, in fact, that business unit generated somewhere

18   around $60 million a year, didn't it?

19   A.   Yeah. And that's correct.

20   Q.   And so as you sit here, there's nothing wrong with a

21   business that licenses patents. Right?

22   A.   No. It's a fine business.

23   Q.   You mentioned a second ago that you were in the courtroom

24   as an expert witness this week. Right?

25   A.   Right.

1   Q.   And you saw Doctor Cooklev go through the products, the

2   CommScope documents, the source code, and his testing. Right?

3   A.   Yes, I did.

4   Q.   And you saw Doctor Madisetti also go through a similar

5   analysis as well as Doctor Brody. True?

6   A.   I didn't see all of Madisetti's presentation,

7   unfortunately. When I walked up, the courtroom was sealed. I

8   guess I could go in, but I didn't want to disturb the jury.

9   Q.   And today you didn't present any of CommScope's

10   documents. Right?

11   A.   No, I didn't present any CommScope documents.

12   Q.   And, in fact, in connection with your expert report in

13   this case, you didn't have access to CommScope documents.

14   True?

15   A.   I don't recall any specific CommScope documents.

16   Q.   And you didn't show any source code to the jury today.

17   Right?

18   A.   No, I've shown no source code.

19   Q.   And, in fact, in this case you didn't have access to any

20   source code, did you?

21   A.   No. The only source code I saw was in the other expert

22   reports that had excerpts of source code.

23   Q.   Correct. But you didn't yourself go through the stack of

24   the thousands of pages of source code. Right?

25   A.   That's -- that's very true.

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 1    Q.   And you didn't get on a plane to go to the source code

 2    computer to inspect it.  Right?

 3    A.   Nope.

 4    Q.   And you're not providing any opinions today on the source

 5    code.  True?

 6    A.   No.  I just rely on the other expert reports on this

 7    matter.

 8    Q.   And you saw as well during Doctor Cooklev's testimony, as

 9    well as Doctor Madisetti's for maybe the portion you saw, and

10    Doctor Brody's a significant amount of testing done on the

11    products right?

12    A.   Yes, I saw their testing.

13    Q.   And you didn't present any evidence to the jury relating

14    to testing.  True?

15    A.   That's correct.

16    Q.   And, in fact, you didn't test any products in connection

17    with this case.  Right?

18    A.   Not in connection with this case, no.

19    Q.   And CommScope didn't give you one?

20    A.   Give me what?  A product to test?

21    Q.   Let me restate that.  CommScope didn't give you a product

22    to test.  Right?

23    A.   No, no, they didn't.

24    Q.   And you saw in the courtroom that there was about 36

25    million units of these CommScope products that have been sold.
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1    Do I have that right?

2    A.   Yeah, that's what I saw.

3    Q.   And you know from your time at Alcatel that, in the

4    ordinarily course of business, companies like CommScope test

5    their products.  Right?

6    A.   Yes, they do.

7    Q.   Including to see how they work for DSL.  Right?

8    A.   Right.

9    Q.   And you didn't present any of those tests today.  Right?

10   A.   That's correct.

11   Q.   And you didn't do any of your own tests, either.

12   A.   Yeah, that's correct, too.

13   Q.   And from what I understand from your presentation, you

14   exclusively relied on your version of what the standards say.

15   Right?  Do you want me to rephrase?

16   A.   I'm sorry.  Please.

17   Q.   The only evidence you presented today for

18   non-infringement is the various DSL and IEEE standards.  True?

19   A.   No.  I also made reference at least to the Nigel Jones

20   analysis of -- of -- of the source code.

21   Q.   But the evidence on which your opinions are based here

22   was on the VDSL standards.  Is that right?

23   A.   Well, I certainly used the VDSL standards.

24   Q.   And the standard -- and you pointed to parts of the

25   standard, both for G.bond and VDSL2 and even G.INP --
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1   A.   Uh-huh.

2   Q.   -- that you contended are implementation specific.

3   Right?

4   A.   Well, the standard said was implementation specific, yes.

5   Q.   Or in the case of G.bond, something that was optional.

6   Right?

7   A.   That is correct.

8   Q.   And if you wanted to know how it was actually

9   implemented, one thing you would need to do is look at the

10   source code. Right?

11   A.   Yeah. That would have told me a lot.

12   Q.   And another thing that you could have done to figure out

13   how these products actually work is tested them. Right?

14   A.   Yeah. That would be a good way, too.

15   Q.   And, again, you didn't present any of that evidence today

16   to the jury, did you?

17   A.   No, I didn't.

18   MR. HURT: If you could pull up exhibit -- I believe

19   it's 34, Mr. Diaz, and go to page 254 on the PDF. This is the

20   VDSL2 standard. 245. I'm sorry, Mr. Diaz. Bottom right,

21   245. So I think it's 254, 253, on the PDF.

22   Q.   (BY MR. HURT) And you understand, Doctor Ransom, that

23   what was accused in Doctor Cooklev's report for at least the

24   '048 Patent, and I think you also mentioned it for the '411

25   Patent, is a field within the O-PMS message. Right?

1   A.   That's right.

2   Q.   And you told the jury that that field specifies time

3   delay. Right?

4   A.   That's correct.

5   Q.   And not memory. True?

6   A.   Not memory.

7   Q.   You see the first paragraph under O-PMS talks about what

8   that message does. Right?

9   A.   Right, it does.

10   Q.   And one of the things that O-PMS does is it specifies the

11   portion of the shared memory that the VTU-R can use to

12   deinterleave the downstream data stream. Right?

13   A.   Right.

14   Q.   It doesn't say time delay there, does it, sir?

15   A.   No. No, it doesn't.

16   Q.   I want to go back to the source code briefly. You do

17   read source code, don't you, Doctor Ransom?

18   A.   I do. Well, in the languages that I know.

19   Q.   And one of those languages is the language C. Right?

20   A.   That's right.

21   Q.   And you understand in C, there is something called a

22   pound define.

23   A.   I do.

24   Q.   And a pound define tells you, if there's something

25   following that pound define, that variable is enabled. Right?

1   A.   Well, a pound define defines a value. It doesn't do

2   anything other than it allows you to then use that expression

3   later on in your code with the value that you assigned at that

4   point.

5   Q.   But it does assign -- at least assigns a value. True?

6   A.   Right, to a symbol. It puts a value equal to a symbol.

7   Q.   And for pound define to -- for when there is a pound

8   define on a symbol, that means that symbol is defined in the

9   source code. True?

10   A.   That's true.

11   Q.   Let me show you what is in your second cross binder.

12   It's some CommScope's source code. This is --

13   MR. BARTON: Your Honor, I believe we need to seal

14   the courtroom for this.

15   THE COURT: All right. Any objection to that, Mr.

16   Hurt?

17   MR. HURT: No objection.

18   THE COURT: All right. Then I'll order the

19   courtroom sealed to protect confidential information.

20   I'll direct the Court Security Officer to escort anyone

21   not subject to the protective order outside of the courtroom

22   where they will remain until it's reopened and unsealed.

23   (Courtroom sealed.)

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10   (Courtroom unsealed.)

11   Q.   (BY MR. HURT) Do you remember on direct examination,

12   Doctor Ransom, you mentioned your experience with the ITU?

13   A.   Yes, I did.

14   Q.   And, in fact, you've been to ITU standards meetings, I

15   assume. Right?

16   A.   Yes, I have.

17   Q.   Including ones about the DSL standards?

18   A.   Well, as I was in the early work on broadband, ISDN, and

19   ATM that became the ADSL stuff.

20   Q.   And you understand in general how DSL procedures work at

21   the ITU when it comes to contributions, don't you?

22   A.   Yes, I do.

23   Q.   And when a contribution comes in, it starts as open.

24   Right?

25   A.   Well, it hasn't -- yes, it does start as open.

1   Q.   You're familiar with the issues list that list out open,

2   closed, and accepted?

3   A.   Yes, I am.

4   Q.   And when a contribution comes in, it starts out as open,

5   doesn't it?

6   A.   Yes, it does.

7   Q.   And if the standard adopts the contribution, it puts in

8   agreed. True?

9   A.   True.

10   Q.   And then there's a third one called closed. You know

11   that?

12   A.   Yes, uh-huh.

13   Q.   And when a standard contribution comes in as closed, that

14   means it's not going in the standard. Right?

15   A.   Right.

16   Q.   And the fact of the matter is, sir, that when the

17   standards body was voting on VDSL2 and deciding should we put

18   LB-031 in the standard, the TI contribution, they rejected it,

19   didn't they?

20   A.   I don't recall that.

21   Q.   Can you flip in your binder to tab 5 and specifically

22   page 20 on the bottom, and let me know when you're there?

23   MR. BARTON: Your Honor, I object. This is not an

24   exhibit on the joint exhibit list.

25   THE COURT: What's your response, Mr. Hurt?

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 1              MR. HURT:  I'm not publishing it to the jury, Your

 2   Honor, but for impeachment purposes and to refresh his

 3   recollection.  It's not being published to the jury at this

 4   time, but Mr. Barton is correct it is not on the joint exhibit

 5   list.

 6              THE COURT:  It doesn't have to be for purposes of

 7   impeachment.  Let's proceed.  At this point the objection's

 8   overruled.

 9   Q.   (BY MR. HURT)  Do you see, Doctor Ransom, there's an

10   entry in the middle of the page?

11   A.   Well, I'm hoping I'm on the right page.  So you said

12   section 5, and I went to section 5, and it's a document ITU

13   telecommunications standard sector.  Is that the correct one?

14   Q.   Yes.

15   A.   Okay.

16   Q.   And if you go to page 20, let me know when you're there.

17   A.   Okay.  Well, I have a problem.  My binder has page 17,

18   19, 21.  It seems to be only odd pages.

19              MR. HURT:  Your Honor, may I approach with the

20   document?

21              THE COURT:  You may approach.

22              MR. HURT:  Thank you.

23              MR. BARTON:  Your Honor, I also do not have the even

24   pages.

25              THE WITNESS:  Okay.  Now I have a page 20.
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1   THE COURT: All right. I'm not sure why that's the

2   case. Is there an additional copy at Plaintiff's table with

3   page 20 in it?

4   MR. DAVIS: No, Your Honor. I don't believe so.

5   This one is missing the even pages as well.

6   THE COURT: All right. Get the document back from

7   the witness, hand it to the Courtroom Deputy. She will step

8   out of the courtroom and go to the copy machine and make two

9   or three copies of it and bring it back to me. And then

10   everybody will have a page 20, and then we'll proceed.

11   (Pause in proceedings.)

12   THE COURT: Give one to Mr. Barton and hand one to

13   the Court Security Officer. And please bring one to me.

14   All right. Let's proceed, Mr. Hurt.

15   Q.   (BY MR. HURT) So looking at page 20, there's an entry

16   6.4.10. Do you see that?

17   A.   Yes, I see that.

18   Q.   And isn't it true, Doctor Ransom, that the ITU closed the

19   proposal for LBO-31 in March of 2005?

20   A.   Yes, that's exactly what it shows here.

21   Q.   And doesn't that mean, sir, that LBO-31 was not adopted

22   into VDSL2?

23   A.   Evidently not in total.

24   Q.   And so when Mr. Dacus got up and told the jury that

25   they're going to have a question about whether TI LB-031 was

1   incorporated in the standard and said, yes, absolutely, that

2   statement wasn't true, was it, sir?

3   A.   I'm sorry. Who made this statement?

4   Q.   When Mr. Dacus, CommScope's lead lawyer, made a statement

5   in opening statement to the jury that you may have a question

6   if TI was incorporated into the VDSL2 standard and the answer

7   is, absolutely, that statement wasn't true, was it, sir?

8   A.   No, it doesn't seem to be accurate.

9   MR. HURT: No further questions. Pass the witness.

10   THE COURT: All right. Redirect, Mr. Barton.

11   MR. BARTON: Yes, sir, Your Honor.

12   THE COURT: All right. Let's proceed with redirect.

13   MR. BARTON: May I proceed, Your Honor?

14   THE COURT: You may.

15   MR. BARTON: Thank you.

16   REDIRECT EXAMINATION

17   BY MR. BARTON:

18   Q.   Doctor Ransom, Mr. Hurt asked a couple of questions about

19   CommScope documents, products, source code. Do you remember

20   all those questions?

21   A.   Yes, I do.

22   Q.   And I believe his suggestion was that you needed to have

23   access to thousands of pages of the documents, hundreds of

24   products, and reams of source code in order to evaluate

25   infringement. Is that how you understood his questioning?

1   A.   Well, I thought that might be the implication.

2   Q.   Okay. Did you need to access those things in order to

3   determine that the CommScope products do not infringe?

4   A.   No. No, I didn't.

5   Q.   Why not?

6   A.   Well, because I had the claim language, and since it was

7   involved in certain standards and we knew that the CommScope

8   products met the standard, I could look to the standard to see

9   how they did things and then compare that to the claim

10   language.

11   Q.   And in Doctor Cooklev's testimony where he looked to

12   source code and testing and things like that, do you

13   understand any of his testimony to indicate that the CommScope

14   products did something different than the standard?

15   A.   No, I don't think so.

16   Q.   Okay. So there are also some questions that Mr. Hurt had

17   about some source code. Do you remember that?

18   A.   Yes.

19   Q.   And he put in -- put in front of you a long list of

20   variables that were being defined in source code. Right?

21   A.   Symbols, pound define symbols.

22   Q.   Pound define symbols. Just because something is defined

23   in source code, does that mean that it's executed or enabled?

24   A.   Well, the -- pound defines don't create executable code.

25   It just is used really by the compiler so that, later on, it

1   can decide typically to include a piece of code or not include

2   a piece of code depending upon whether a symbol has been

3   defined.

4   Q.   So just because you see a symbol defined with a certain

5   name, that doesn't mean that that product does whatever that

6   name is. Is that fair?

7   A.   Oh, that's -- that's quite fair.

8   Q.   Okay.

9   MR. BARTON: Pass the witness, Your Honor.

10   THE COURT: Further cross-examination?

11   MR. HURT: No, Your Honor.

12   THE COURT: All right. Doctor Ransom, you may step

13   down, sir.

14   THE WITNESS: Thank you. Should I take these

15   binders?

16   THE COURT: Just leave them there, sir. Thank you.

17   MR. BARTON: Your Honor, may Mr. Ransom be excused?

18   THE COURT: Doctor Ransom may be excused.

19   It means you're free to stay or free to leave, Doctor.

20   It's up to you.

21   All right. Defendants call your next witness.

22   MR. BARTON: Your Honor, at this point we have some

23   more deposition testimony to play into the record.

24   THE COURT: Announce your deposition witnesses, and

25   then we'll proceed with them.

1   MR. BARTON: Your Honor, at this point we'd like to

2   play the deposition testimony of Mr. Christopher Cahill, who

3   is a CommScope engineer.

4   THE COURT: Do you have the times on this?

5   MR. BARTON: Sorry. I -- I apologize. He is not a

6   CommScope engineer. He is one of the named inventors on the

7   '881 Patent.

8   And the times that should be charged are 4 minutes and 48

9   seconds to CommScope and 4 minutes and 32 seconds to TQ Delta.

10   THE COURT: All right. Let's proceed with this

11   witness by deposition.

12   CHRISTOPHER WILLIAM CAHILL, BY SWORN DEPOSITION,

13   Q.   Sir, could you state your full name, please?

14   A.   Christopher William Cahill.

15   Q.   And, Mr. Cahill, am I correct that at one point in time

16   in your career, you worked for Aware?

17   A.   That's correct.

18   Q.   And you departed that company in or around 2012. Do I

19   have that right?

20   A.   That's right, in the summer of 2012.

21   Q.   And you had never been employed by TQ Delta. Is that

22   right, sir?

23   A.   No.

24   Q.   You've never been compensated in any way from TQ Delta.

25   Is that right?

1   A.   No.

2   Q.   Okay. Tell me about the -- the trade show where this

3   idea was bandied around.

4   A.   You know, I'm guessing that it was a trade show. I

5   remember it being in the summer, I think, that we had -- had

6   these discussions. And typically there was kind of a -- a

7   rash of early summer trade shows, and I kind of remembered

8   that somebody had come -- come back from one.

9   I don't have a lot of -- a deep conviction on this, but I

10   kind of remember that somebody had come back and said, this

11   had come up. And, you know, we were -- we were a technology

12   expert at the time on DSL technology, and, you know, this

13   might be a good thing for us to work on.

14   Q.   Okay.

15   A.   But I don't have a lot of details on how that -- on

16   how -- on the genesis of the idea.

17   Q.   It's your understanding that at this trade show, there

18   was a discussion about using multiple copper lines -- multiple

19   telephone lines to look like one pipe for purposes of DSL. Is

20   that right?

21   A.   Yeah, I -- again, I don't really remember the details on

22   how the -- on the genesis of the idea. I thought -- I kind of

23   have a vague memory that it had come from a trade show, but I

24   don't know which show or what -- or even who the person was

25   that -- that brought the idea back to the -- back to the

1   company.

2   Q.   Okay. So you don't know who it was that attended that

3   trade show --

4   A.   No.

5   Q.   -- on behalf of Aware?

6   A.   No, I don't.

7   Q.   I take it, it wasn't you.

8   A.   It wasn't me, no.

9   Q.   All right. So somebody came to you with the idea of

10   using two different copper lines to look like one pipe. Is

11   that right?

12   A.   Yeah. Marcos -- sorry. Marcos Tzannes came to me with

13   the idea, and he had said that he had already discussed it

14   with Edmund Reiter.

15   Q.   Okay. And do you know whether it was Mr. Tzannes that

16   attended that trade show?

17   A.   No. I don't know.

18   Q.   Now, you stated there were some complexities with, I

19   think you said, software and hardware and chip design. Did I

20   hear you right?

21   A.   That's right.

22   Q.   Talk to me about what the complexities you believed

23   existed with respect to chip design.

24   A.   So from a chipper perspective, it mainly had to do with

25   memory. So what -- what we had realized quickly during our

1   discussions is that the two -- let's say -- let's just say

2   that there are two pairs that we're trying to bond together.

3   There could be more, but for the sake of argument let's just

4   say there's two.

5   And the issue that we -- that we quickly realized is that

6   one of those pairs might be -- have -- have a significantly

7   different construction than the other pair. And this is just

8   the way the telephone world works where, you know, in -- in --

9   in the early days they might have laid out a pair to a certain

10   home, and then 50 years later, 75 years later, they might have

11   laid out a different pair to the home. And the way they are

12   wired on the streets might have been completely different.

13   In other words, like one -- one wire could go

14   from -- from the center of the town to, you know, a mile away,

15   and you would just tap off the pair to go to the home and just

16   not do anything with the run that went a mile away.

17   And so a lot of what would happen is that, what we call

18   latency in the -- in the cOMs world, which is basically delay,

19   could be different on one pair versus another pair. And so if

20   you think about the way we were kind of like putting these --

21   these blocks -- these data blocks together, these -- we'll

22   call it datagram, I guess, these datagrams together, one could

23   get there, you know, from one pair early, and then you could

24   get another one from that first pair early.

25   So, you know, Counts 1 and 3 and 5 could get to -- to the

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 1   home early, and you're waiting for Counts 2 and 4 and 6 from

 2   the other pair. So you'd have to store those first data --

 3   datagrams or blocks of -- of communication in -- in the modem

 4   or in -- in the home while you're waiting for the other set to

 5   come.

 6   So when we started to do calculations and -- and say,

 7   wow, we would need to store a lot of -- a lot of

 8   communications data from one of the pairs while we're waiting

 9   for that, the memory -- the memory aspect of it became very

10   obvious that we would have to -- that we'd have to deal with

11   that from a chip perspective.

12   Q.   Does that mean using a bigger memory from a chip

13   perspective?

14   A.   Yeah, higher memory -- higher count of bytes in -- in

15   the -- in the -- in the modem.

16   And then on top of that -- you asked about the chip

17   complexity. On top of that, we had to have the logic in the

18   chip that would -- that could put together the stream of -- of

19   blocks from each of the channels and, you know, and actually

20   construct what would look like a single pipe from two

21   different pipes. So that -- all that logic was part of

22   the -- part of the chip as well. So -- yeah.

23   Q.   All that logic and hardware exists at the chipset level.

24   Is that fair?

25   A.   Most of it -- most of it was in the chip, but there was a

1   control aspect from a software perspective to -- to

2   configure -- you know, after learning about the different

3   channels that -- that are coming into the home, learning about

4   the latencies and about the speeds that those two different

5   channels could -- could deal with, then you'd have to

6   configure the chips.

7   So there was a software -- so I'll call it a management

8   layer that was critical to -- to getting a successful bonded

9   channel together.

10   Not really. I was part of the -- the hardware -- you

11   know, the board level electronics team. There were other

12   people involved in the -- in the ACIC -- in the chip side

13   that -- that had a better understanding of that than I did. I

14   didn't really have that as my everyday -- as everyday

15   knowledge, what the memory costs were.

16   Q.   Okay. But I take it that it was not so cost prohibitive

17   to stop you from doing this. In fact, when you built a

18   product that incorporated some of that bonding, that you did

19   need a bigger memory. Is that right?

20   A.   Yeah, we knew we needed to add memory, and we -- we -- we

21   kind of made the cost tradeoffs -- I'm -- I'm assuming we made

22   some cost tradeoffs at the time that said, you know, we -- we

23   can go to an unbelievable extreme of what the ratio of these

24   two different telephone pairs are like. But we -- we set some

25   guidelines just to say, okay, maybe it's a 4 to 1 or an 8 to 1

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 1    ratio between the two -- the two, and that's how we'll decide

 2    our memory.

 3         You know, we couldn't -- we couldn't -- we couldn't pick

 4    a memory that was infinitely large enough to handle an extreme

 5    that just was irrational as far as a marketing -- from a

 6    marketing perspective.  So, yeah, I think it was like 4 to 1

 7    or 8 to 1, something like that.

 8    Q.   To say that a different way, effectively you-guys set a

 9    maximum latency difference.  Is that fair?

10    A.   That's correct.

11    Q.   Did Aware or did you receive any industry praise for your

12    work in the concept of bonding?

13    A.   Not that I remember.

14    Q.   Okay.  Are you familiar with the ITU standards regarding

15    bonding?

16    A.   Not -- not with any kind of comprehensive details.  I

17    mean, I know -- I know the -- the technology existed, and some

18    of the -- or I don't know how much of the concepts that are in

19    our patent exist in the standard, but, you know, some of the

20    main ideas were -- were put in the patent.

21    Q.   Some of the main ideas -- and Aware was not the only

22    company that contributed to the G.bond standard.  Is that

23    fair?

24    A.   I'm sure that's the case.  It would be rare that one

25    company would have sole, you know, ownership of a -- of a
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1   standard.

2   Q.   If you're telling me you're not familiar with either of

3   the two standards I put in front of you, then I won't make you

4   go through this exercise.

5   A.   Yeah, I'm aware they existed and I'm aware, you know, of

6   their basic functionality, but I haven't read all the

7   language -- all -- all the text.

8   Q.   Okay. Who was responsible for Aware's contributions to

9   be standard as it relates to bonding?

10   A.   So I -- you know, I'll say definitely Marcos Tzannes, and

11   then, you know, I don't know if anybody else in those days

12   went to the standards meetings other than Marcos. But I'm

13   sure there were -- as we were developing the ASICs and as we

14   were developing -- you know, as we had done testing and

15   interoperability, I'm sure there was things coming out of

16   those exercises that informed Marcos and whoever about ways to

17   make the standard better and, you know, more -- more reliable

18   in terms of -- in terms of a standard. So -- but I think

19   Marcos was the primary Aware person that was contributing to

20   the standard.

21   THE COURT: Does that complete this witness by

22   deposition?

23   MR. STEVENS: It does, Your Honor.

24   THE COURT: Do you have another deposition witness

25   to present?

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 1              MR. STEVENS:  We do, Your Honor.

 2              THE COURT:  Please proceed.

 3              MR. STEVENS:  And that will be Michael Lund.  He's

 4    one of the named inventors on the '048 Patent.

 5         And the time for CommScope is 2 minutes and 32 seconds.

 6              THE COURT:  No time for TQ Delta?

 7              MR. STEVENS:  Correct, Your Honor.

 8              THE COURT:  Please proceed.

 9                   MICHAEL LUND, BY SWORN DEPOSITION,

10    Q.   Could you please state and spell your full name for the

11    record?

12    A.   Sure.  Michael Lund, M-I-C-H-A-E-L, L-U-N-D.

13    Q.   Why did you leave Aware?

14    A.   I didn't believe that DSL was a good long-term place to

15    be.

16    Q.   Any other reasons for leaving Aware?

17    A.   Aware didn't have suitable commitment to growing --

18    growing and expanding the part of the business that I was

19    involved in.

20    Q.   And that refers to the DSL business?

21    A.   Correct.

22    Q.   During your time at Aware, did you ever work with Marcos

23    Tzannes?

24    A.   Yes.

25    Q.   What projects did you work on with Marcos Tzannes?
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1   A.   Primarily in his role as the, you know, ITU

2   representative in terms of vetting, you know, vetting

3   proposals that we would make to the ITU or reviewing ITU

4   contributions from other sources.

5   Q.   Aside from working with Marcos Tzannes in his role as the

6   ITU representative, did you work with him in any other

7   capacities at Aware?

8   A.   Also in his role as kind of the curator of the -- the

9   patent portfolio. So in terms of, you know, doing patent

10   disclosures or, you know, similar things.

11   Q.   Did you work with Marcos Tzannes and did -- did he -- did

12   he help you write code, work out any of the problems that you

13   were working on?

14   A.   Never.

15   Q.   What was Marcos Tzannes' contribution to the idea of a

16   transceiver that's designed to share memory between multiple

17   applications?

18   A.   I don't know.

19   Q.   Do you recall discussing a transceiver designed to share

20   memory that supports multiple applications with Marcos

21   Tzannes?

22   A.   I never talked to Marcos about this patent.

23   THE COURT: Does that complete this witness by

24   deposition?

25   MR. STEVENS: It does, Your Honor.

1   THE COURT: All right. Defendants, call your next

2   witness.

3   MR. BRADLEY: Your Honor, Defendants call Mr. Bruce

4   McNair.

5   THE COURT: All right. Mr. McNair, if you'll come

6   forward, please, and be sworn.

7   Are there binders to be distributed, Mr. Bradley?

8   MR. BRADLEY: Yes, there are, Your Honor.

9   THE COURT: Let's do that while the witness is being

10   sworn.

11   (Whereupon, the oath was administered by the Clerk.)

12   THE COURT: Please have a seat on the witness stand,

13   Mr. McNair.

14   Do we have a binder for the witness?

15   All right, Mr. Bradley. You may proceed with direct

16   examination.

17   MR. BRADLEY: Thank you, Your Honor.

18   BRUCE McNAIR, SWORN,

19   having been duly sworn, testified under oath as follows:

20   DIRECT EXAMINATION

21   BY MR. BRADLEY:

22   Q.   Good afternoon, Mr. McNair.

23   A.   Good afternoon.

24   Q.   I'm Kirk Bradley, one of the attorneys for CommScope.

25   Can you please introduce yourself to the jury?

1   A.   Yes.   My name is Bruce McNair.   I have over 50 years'

2   experience teaching and developing telecommunication systems,

3   particularly including the technology that's used in DSL such

4   as multicarrier modulation, forward error correction, and

5   interleaving.

6   Q.   And, sir, were you retained by CommScope to address

7   whether the '835 Patent is invalid?

8   A.   Yes, I was.

9   Q.   Did you prepare some demonstrative slides to assist with

10   your testimony today?

11   A.   I did.

12   Q.   Up on the screen, I have slide 2.   And, sir, will you

13   please briefly describe your educational background?

14   A.   Yes.   I have a Bachelor of Engineering in electrical

15   engineering from Stevens Institute of Technology in 1971, and

16   I have a master's in electrical engineering from Stevens in

17   1974.

18   Q.   And, sir, can you please describe briefly some of your

19   professional experience, starting with your time at AT&T Bell

20   Labs?

21   A.   I joined AT&T Bell Labs in 1978.   I worked there at AT&T

22   labs until 2002.   During that time, I worked on high speed

23   data networks.   I worked on analog modems that work over the

24   subscriber loop.   I worked on secure voice communications.   I

25   spent some time doing computer and network security.

1   And for the last eight years of my time there, I worked

2   on high speed wireless communications, again using the same

3   technology--multicarrier modulation and forward error

4   correction, as is described in the DSL standards.

5   Q.   So is it fair to say that the work you did during your

6   time at AT&T involved or related to DSL technologies?

7   A.   Yes.

8   Q.   And, sir, after you left AT&T in 2002, what have you been

9   doing professionally?

10   A.   I joined the faculty at Stevens Institute of Technology

11   where I've taught undergraduate and graduate courses in

12   computer engineering, electrical engineering, and related

13   subjects.

14   I started teaching online at Stevens in 2003. And after

15   retiring from my full-time position in 2017, I continued the

16   20 years I've been doing online teaching.

17   Q.   And, sir, during your 50 years of experience, have you

18   published articles that relate to DSL or telecommunications or

19   related subjects?

20   A.   Yes. All of my publications are related to

21   telecommunications and, again, several of them involve the

22   multicarrier communications and forward error correction of

23   DSL.

24   Q.   And do those publications or at least some of them

25   involve technology called OFDM?

1   A.   Yes.   OFDM is the name used by wireless systems to refer

2   to the same multicarrier communications that the DSL refers to

3   as discrete multitone, or DMT.

4   Q.   And, sir, are you a named inventor on any United States

5   patents?

6   A.   Yes.   I have 26 United States patents.   All but a couple

7   of them are involving telecommunications, and several of them

8   involve OFDM, the multicarrier systems.

9   MR. BRADLEY: Your Honor, I move that Mr. McNair be

10   admitted as an expert in the field of telecommunications and

11   the subject matter of the asserted patents.

12   THE COURT: Is there objection?

13   MR. McANDREWS: No objection, Your Honor.

14   THE COURT: Without, objection the Court will

15   recognize this witness as an expert in the designated fields.

16   Please continue, counsel.

17   MR. BRADLEY: Thank you, Your Honor.

18   Q.   (BY MR. BRADLEY)   Mr. McNair, are you familiar with the

19   '835 Patent?

20   A.   Yes, I am.

21   Q.   And you understand that's one of the patents asserted by

22   TQ Delta against CommScope?

23   A.   Yes, I do.

24   Q.   Did you form opinions that we're going to talk about

25   today relating to the '835 Patent?

1 A.   Yes, I have.

2 Q.   And just to orient ourselves, sir, is this the patent

3 that talks about switching from one set of FIP parameters,

4 forward error corrections, and interleaver parameters to a

5 different set?

6 A.   Yes, it is.

7 Q.   And have you analyzed whether the asserted claim of this

8 patent, which is claim 10, have you analyzed whether that

9 claim is invalid?

10 A.   I have.

11 Q.   Before we discuss your opinion on invalidity, let me ask

12 you this. Have you formed an opinion about the level of skill

13 that folks in this art would have -- would have had back at

14 the time?

15 A.   Yes. It's my opinion that a person of ordinary skill in

16 the art would have a Bachelor's degree with five or six years

17 of experience in telecommunications and related fields.

18 Alternatively, they could have a higher level of education

19 and, correspondingly, less experience.

20 Q.   And do you understand, sir, whether TQ Delta offered a

21 different description of the level of ordinary skill in this

22 art?

23 A.   Yes. It's a different description, but it's similar.

24 Q.   And, sir, when you considered your questions -- when you

25 formed your opinions on invalidity, did you consider that

1   question of invalidity from the perspective of a person of

2   ordinary skill in the art?

3   A.   Yes.

4   Q.   And did you yourself have that level of skill back at the

5   time?

6   A.   I did.

7   Q.   And, sir, regardless of which of these two meanings that

8   the jury ultimately adopts, did you have that level of skill

9   back at the time?

10   A.   Yes.

11   Q.   And does the jury's decision on which of these levels of

12   skill in the art impact your opinions one way or the other?

13   A.   No, I don't think it would.

14   Q.   Sir, have you had the opportunity to read and review the

15   Judge's claim constructions that pertain to the '835 Patent?

16   A.   Yes, I have.

17   Q.   Did you apply those constructions in forming your

18   opinions?

19   A.   I did.

20   Q.   And, sir, what ultimate conclusion -- we'll go through

21   the details in a moment. What ultimate conclusion did you

22   reach about the '835 patent and its validity or invalidity?

23   A.   I believe it's invalid. All of the material described in

24   the patent is old technology that's been well-known in the art

25   for quite some time.

1   Q.   And when you say it's invalid, we're just talking about

2   claim 10 of the patent. Is that right?

3   A.   That's right. I understand that's the asserted claim

4   against TQ Delta -- against CommScope.

5   Q.   And, sir, do you recall how many claims are in this

6   patent?

7   A.   32, I believe.

8   Q.   And your opinions are addressing just one of those

9   claims. Is that right?

10   A.   That's right.

11   Q.   And it's claim 10, you said?

12   A.   Yes, it is.

13   Q.   Do you recall that that depends from claim 8?

14   A.   Yes. It's a dependent claim on claim 8, so obviously the

15   limitations of claim 8 need to be included when reading claim

16   10.

17   Q.   So, sir, are your opinions that you're offering here in

18   court today, are they trying to wipe out all 32 of the claims?

19   A.   No, I'm only addressing claim 10 and, thereby, 8.

20   Q.   Sir, I've put the front of the '835 Patent back on the

21   screen.

22   Sir, when did Aware first approach the Patent Office to

23   try to get this patent?

24   A.   It was in March of 2004.

25   Q.   Is that what this shows on this slide here with --

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1    A.    Yes.

2    Q.    -- Exhibit 6?

3          What is the significance of the March 2004 date?

4    A.    Well, any information that was available before 2004

5    would be considered art that could be considered to read on

6    the patent, and if I find that it's -- teaches information

7    about the patent, then that would invalidate the patent.

8    Q.    So is it fair to say, sir, that materials and

9    publications before the March 2004 date would have come

10   before the invention?

11   A.    Yes.

12   Q.    Okay.  Sir, when the '835 Patent was filed, was it

13   already known to use forward error correction and interleaver

14   settings--these FIP settings--was that already known for

15   helping to deal with impulse noise?

16   A.    Oh, yes.  That was known for decades.

17   Q.    Does the '835 Patent admit that or talk about that?

18   A.    Yes, it does.  It acknowledges that, as the description

19   of related art indicates, that it was standard practice for

20   communication systems to use interleaving in combination with

21   forward error correction to correct the errors that were

22   caused by importing pulse noise.

23   Q.    So, sir, is what is on the screen here, is that the -- a

24   portion of the '835 Patent itself?

25   A.    Yes, it is.
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1   Q.   Is this describing things that were already known in the

2   art?

3   A.   Yes. As it says, it was standard practice.

4   Q.   And standard practice to do what?

5   A.   Standard practice for communication systems using

6   interleaving and forward error correction to control impulse

7   noise.

8   Q.   And in this patent when it talks about switching from one

9   set of those settings to a different set, do you recall

10   generally that there is a flag signal requirement we'll look

11   at more later?

12   A.   Yes.

13   Q.   When the '835 Patent was filed, was it already known?

14   Was it already old technology to use something called a flag

15   signal when you're switching settings?

16   A.   Yes, that was previously described by material in related

17   fields that this would be something we could do. And as an

18   example, the patent itself indicates that the flag or marker

19   signal could be an inverted sync flag and that it refers to

20   the ADSL standard G.992.3.

21   Q.   So is what we see on the screen here, is that part of the

22   '835 Patent itself?

23   A.   Yes, it is.

24   Q.   And is it acknowledging that flag signals were already

25   known?

1   A.   Yes, it does.

2   Q.   And does it give an example -- I think you described it.

3   Does it give an example of where flag signals were already

4   known?

5   A.   Yes, it describes from the ADSL2 standard.

6   Q.   For your opinion on invalidity of claim 10 of this

7   patent, do you rely on the ADSL standard?

8   A.   Yes, I do.

9   Q.   Is that what we see here on the screen, Exhibit 48?

10   A.   Yes, that's -- the ITU number is G 992.1, and it refers

11   to ADSL transceivers.

12   Q.   And just to be clear, what is the date of this ADSL

13   standard?

14   A.   June of 1999.

15   Q.   Is that before or after when the application for the '835

16   Patent was filed?

17   A.   It's almost five years before the '835 Patent.

18   Q.   And, in your opinion, does the ADSL standard, Exhibit 48,

19   have every single element that's required by claim 10 of the

20   '835 Patent?

21   A.   Yes, it does.

22   Q.   When the examiner at the Patent Office was deciding

23   whether to issue the '835 Patent, did the examiner consider

24   this document?

25   A.   No.

1   Q.   How do you know that, sir?

2   A.   Well, as part of the patent, as shown here in the

3   demonstrative, there's something called "references cited,"

4   and when the examiner goes through the process of looking at

5   the patent and trying to decide whether or not it's -- whether

6   it's valid, whether it can be issued, they will cite any

7   references that they examine, and the ADSL standard G.992.1 is

8   not listed here, so that tells me that the examiner didn't

9   consider it.

10   Q.   Did the examiner just not have all the information you've

11   seen?

12   A.   Well that's right, because I've looked extensively at the

13   ADSL standard, and, again, I found all of the requirements of

14   the claim in the standard, and I don't see the standard on the

15   list, so that tells me that the examiner didn't look at that.

16   Q.   Have you read the '835 Patent?

17   A.   Yes, I have.

18   Q.   And do you recall within the description of the '835

19   Patent references to ADSL technology or G.992.X, things like

20   that?

21   A.   Yes.

22   Q.   And what does that mean? Does that mean that the

23   examiner reviewed or considered the ADSL standard that's

24   Exhibit 48?

25   A.   No, it doesn't refer to the 992.1 standard. It talks

1   about ADSL in generic terms, ADSL technology or ADSL systems

2   or generic ADSL standards, but it does not specifically

3   mention the 992.3 -- 992.1 standard. And again, it's not

4   listed in the references, so it's not been considered.

5   Q.   And just to be clear, if the examiner had considered the

6   ADSL standard document that you rely on, would it have been

7   listed?

8   A.   Certainly.

9   Q.   Okay. Here we see the ADSL standard document again,

10   G.992.1. Was this issued by the ITU-T?

11   A.   Yes, it was.

12   Q.   Does this ADSL standard describe using forward error

13   correction and interleaving settings, these FIP settings?

14   A.   Yes, it does.

15   Q.   And where does it do that, sir?

16   A.   Well, here in the demonstrative at paragraph 7.6 it talks

17   about forward error correction, and it says that the ADSL

18   transceivers will support any combination of forward error

19   correction coding capabilities. And in 7.6.3 it talks about

20   interleaving and it talks about the fact that the codewords,

21   the forward error correction codewords will be interleaved.

22   Q.   So are the forward error correction and interleaver

23   parameter settings, these FIP settings, are they set out in

24   words expressly in the ADSL standard?

25   A.   Yes, they are.

1   Q.   Does the ADSL standard talk about changing those

2   settings, those FIP settings?

3   A.   Yes, it does.

4   Q.   And what does it say about that?

5   A.   Well, in Appendix II it talks about dynamic online rate

6   adaptation.

7   Q.   Let me stop you there real quick. What does 'adaptation'

8   mean here?

9   A.   Well, that means that the transceiver will adapt to

10 whatever the conditions of the communication line are. So if

11 the communication line gets worse, the settings may need to be

12 changed to deal with the changing conditions.

13 Q.   So does 'adapting' here mean changing or switching the

14 settings?

15 A.   Yes.

16 Q.   And do we know from the ADSL standard which settings it

17 can adapt or change or switch?

18 A.   Yes. Well, specifically in Appendix II.1.1 the general

19 concepts, it indicates that rate modification, including other

20 things, but will include forward error correction and

21 interleaver settings the FIP parameters.

22 Q.   And on the screen here we see FEC. What does that stand

23 for?

24 A.   Forward error correction.

25 Q.   And so is this saying that when you do the swap or the

1   switch to new settings, that it includes swapping or switching

2   forward error correction and interleaving settings, the FIP

3   settings?

4   A.   That's what it says, yes.

5   Q.   Sir, have you prepared a demonstrative that describes

6   more generally how the ADSL system--excuse me--how the ADSL

7   standard can be implemented and how it coordinates the switch?

8   A.   Yes.

9   Q.   Can you please describe what we see on the screen here?

10   A.   Yes. So what's on the screen now is a communication

11   between what's called the ATU-C--that's the ADSL transceiver

12   unit at the central office--and the ATU-R--the ADSL

13   transceiver unit at the remote site, the person's home--and

14   there's a communication between them. And there's a

15   multi-step process, but the last step is called the

16   DRA_swap_request, and that is the flag; that's what tells the

17   customer premises equipment when the swap will be occurring so

18   that they can coordinate and they can both switch at the same

19   time.

20   Q.   So does ADSL describe having a first set of FIP settings

21   and then you get a flag signal saying, Hey, it's time to

22   switch, and that goes to a second set of settings?

23   A.   Yes.

24   Q.   Okay. Are you aware of another example of a flag signal

25   that's known in the art? And when I say 'another', I mean in

1   addition to what you just described here with ADSL.

2   A.   Yes.

3   Q.   Are you aware of another example?

4   A.   I am.

5   Q.   And what is that?

6   A.   Well, that's temporary document SC-060. I refer to it as

7   a Texas Instruments contribution to the ITU standards

8   activity. And this is protocol for online reconfiguration of

9   ADSL.

10   Q.   And what we see here with Exhibit 57 when it says

11   "protocol for online reconfiguration," what is

12   'reconfiguration' talking about here?

13   A.   Well, again, 'reconfiguration' or 'adaptation' basically

14   mean we're changing the parameters of the communication link;

15   for whatever reason, if the conditions have improved or have

16   degraded, we need to switch to different settings to optimize

17   the performance of the system.

18   Q.   And I think you might have said, but who made this

19   contribution to the ITU? Was it Mr. Tzannes or Aware or was

20   it someone else?

21   A.   It was Texas Instruments; you know, commonly called TI.

22   Q.   And when did Texas Instruments make this contribution to

23   the ITU?

24   A.   Well, the date of the contribution is listed here. It

25   was August 2001, or about three years before the patent was

1   first filed.

2   Q.   And the patent was first filed in March of 2004. Is that

3   right?

4   A.   That's right; three years later.

5   Q.   So this came before. Is that right?

6   A.   Yes, it did.

7   Q.   Does this Texas Instruments contribution to the standard,

8   does it describe use of flag signals in the context of

9   switching settings for the transceivers?

10   A.   Yes, it does.

11   Q.   And we have here some sections on the screen. Can you

12   describe how the Texas Instruments contribution changes

13   settings by using this flag signal?

14   A.   Yes. Well, there's a request to change the settings, and

15   then there's a sync flag which is sent back from ATU2 to ATU1,

16   and that sync flag is indicating at what point in time the

17   changeover will occur. And you'll see at the bottom of the

18   demonstrative it says "reconfiguration!" and that's basically

19   saying that's the point in time when the reconfiguration is

20   actually going to happen, the switch between one set of

21   parameters and another.

22   Q.   So the Texas Instruments contribution titled "Protocol

23   For Online Reconfiguration at ADSL," it's reconfiguring

24   settings and using a sync flag to do that?

25   A.   Yes, it is.

1   Q.   And is the sync flag a flag signal?

2   A.   Yes, it is. It's -- in fact, it's the same flag signal

3   as described in the '835 Patent in Section 3.3. It says, "The

4   synch flag is an inverted synch symbol;" exactly the same

5   thing as what the patent describes.

6   Q.   So this Texas Instruments contribution, it says at the

7   top, "sending a synch flag." Is that the flag signal; sending

8   a flag signal?

9   A.   Yeah, sending a sync flag in place of a sync signal. So

10   there's a sync signal which occurs all of the time, and when

11   you want to do the reconfiguration you send the sync flag,

12   which is just the inverted sync signal -- symbol.

13   Q.   And I might have misspoken. Is the sync flag described

14   here, is that a flag signal?

15   A.   It is.

16   Q.   Okay. And you mentioned that it says a sync flag is the

17   inverse of the sync symbol, and did you say that relates

18   somehow to what's described in the '835 Patent?

19   A.   Yes. Well, again, in the '835 Patent, here's a quote

20   from the specification; it says For example, the flag signal

21   could be an inverted sync symbol or sync flag as used in

22   ADSL2, but also as used in the Texas Instruments contribution.

23   Q.   Is this -- this is the '835 Patent talking. Is that

24   right?

25   A.   This is the '835 Patent.

1   Q.   Is it describing things that were already known?

2   A.   Yes. This was known previous to the filing of the

3   patent.

4   Q.   And is the '835 Patent you're giving as an example saying

5   to use that inverted sync symbol we just looked at in the

6   Texas Instruments as the flag signal?

7   A.   Yes.

8   Q.   Sir, I want to walk through claim 10, which is the claim

9   on -- that they've asserted that you've opined on. I put just

10   claim 10 here, and I see at the beginning it says "the

11   apparatus of claim 8." And what does that introduction mean

12   to you?

13   A.   Well, that means that this is what's called a dependent

14   claim. So claim 10 depends on claim 8, so any of the

15   limitations that have to be met for claim 8 must also be met

16   for claim 10.

17   Q.   So when you analyzed the invalidity of claim 10, did you

18   actually look at all of those initial requirements from claim

19   8 and then continue on with the added requirement of claim 10?

20   A.   Yes.

21   Q.   Okay. Let's go through these one-by-one. And the first

22   one that's written here says, "An apparatus configurable to

23   adapt forward error correction and interleaver parameter

24   settings during steady-state communication or initialization

25   comprising" some things we're going to talk about.

1   Do you see that?

2   A.   Yes.

3   Q.   And is that described or disclosed in that ADSL standard

4   document that came before the patent?

5   A.   Yes, it is. It's described here in Appendix II entitled

6   "Dynamic Online Read Adaptation." And again, 'adaptation'

7   means we are switching between different parameter sets. And

8   the highlighted area says, "This reconfiguration occurs during

9   Showtime"--and Showtime is the name that ADSL uses for these

10 steady-state communication--"as required by the patent claim."

11 Q.   So when we're looking at this initial part of the claim

12 and it says we're going to have an apparatus that you can

13 adapt or switch or change these FIP settings during Showtime

14 steady-state communication, was that old and already known

15 from at least ADSL, or was that something that Mr. Tzannes

16 invented?

17 A.   No, it's old. It was described in the ADSL standard. It

18 was five years earlier.

19 Q.   We are going to go through these one-by-one. The next

20 says, "a transceiver, including a processor, as configurable"

21 to do some things we'll talk about.

22   Did the ADSL standard document that you've relied on,

23 did that have a transceiver with a processor.

24 A.   Yes. Well, the title of the standard talks about DSL

25 transceivers, so obviously they were thinking about

1   transceivers for the standard. And particularly when we build

2   a transceiver we need to process data. We need to process the

3   information that's flowing through the communications, and

4   that obviously is done with a processor. That would be the

5   way a person of ordinary skill in the art would recognize

6   that's the way we build these things.

7   Q.   And I see here, this is an excerpt from the ADSL standard

8   document that you rely on. There's some abbreviations, and I

9   see the last three -- one of them's highlighted. The last

10   three say ATU and then ATU-C and ATU-R. What are those?

11   A.   Well, that's the abbreviation. ATU is ADSL transceiver

12   unit, and then the qualifications--there's the central site

13   one at the central office ATU-C, and there's the one at the

14   remote site, the customer's home, or we call it customer

15   premises equipment, that's ATU-R.

16   Q.   No question that ADSL talks about transceivers that have

17   processors. Right?

18   A.   Yes.

19   Q.   The next requirement says, transmit a signal using that

20   first FIP setting -- before we switch, transmit a signal with

21   the first FIP setting. Does ADSL disclose that part of the

22   claim?

23   A.   Yes, it does. Again, in Section 7.6 and 7.6.3, it talks

24   about using forward error correction coding; and in 7.6.3 it

25   talks about interleaving. So these are the FIP parameter

```
1    settings that the forward -- the FEC and interleaver parameter

2    FIP settings.

3    Q.   So this is -- am I correct, sir, that this is the first

4    set of settings before you got the flag signal, before you

5    switched to a new set?

6    A.   Yeah, there will be some initial settings before

7    adaptation, and we'll talk about the ones that come after

8    adaptation or the switch.

9    Q.   Is this expressly written in the ADSL standard document?

10   A.   Yes, it is.

11   Q.   The next requirement we've already talked a little bit

12   about.  It's the "transmit a flag signal."  And you understand

13   the Court construed 'flag signal'.  Right?

14   A.   Yes.

15   Q.   And is that construction what we see on the screen here?

16   A.   It is.

17   Q.   And did you apply that construction in forming your

18   opinions that you're expressing here today?

19   A.   I did.

20   Q.   And applying that construction of 'flag signal', does the

21   ADSL standard disclose -- in the old prior art before the '835

22   Patent, does it disclose a flag signal?

23   A.   Yes, it does.

24   Q.   And what does the ADSL standard say about that?

25   A.   Well, it indicates that the DRA_swap_request, the message
```

1   that I talked about before, will be sent by the ATU-C to

2   inform the ATU-R. So this is the central office telling the

3   customer premises when to make the swap. And you can see in

4   the bottom of the demonstrative there is the transmission of

5   the swap request from the ATU-C to the ATU-R, and that says

6   it's time to switch.

7   Q.   Is that a flag symbol?

8   A.   That's the flag symbol.

9   Q.   I think you mentioned the DRA_swap_request is sent from

10   one transceiver to the other about when to swap the rate.

11   Does that qualify -- that DRA_swap_request, does that qualify

12   as a flag signal under the Judge's construction of that term?

13   A.   Yes, it does.

14   Q.   If we look back at the Judge's construction for 'flag

15   signal', there's a bit at the end here that says, in

16   parentheses, it says that this flag signal does not include

17   something. Do you see that?

18   A.   Yes.

19   Q.   And it says the flag signal does include something called

20   an FEC codeword counter value on which the updated settings

21   you're going to switch into is to be used. Do you see that?

22   A.   I see that.

23   Q.   And when you formed your opinion about a flag signal, you

24   applied this whole construction, including this carve-out. Is

25   that right?

1   A.   Oh, yes, certainly. That's what I had to do.

2   Q.   Does the flag signal that you've identified in ADSL, this

3   DRA_swap_request message flag signal, does it include a

4   codeword counter value?

5   A.   No, it does not.

6   Q.   Does it count any codewords?

7   A.   No.

8   Q.   Very generally, what is a codeword?

9   A.   A codeword is the information that's packed together to

10   enable the information to be decoded in the presence of

11   errors. So there are a number of codewords that are

12   transmitted during transmission from the -- between the

13   transceiver units, and they're packed together in what's

14   called a superframe.

15   Q.   Does the DRA_swap_request message, the flag signal that

16   you've identified, does it count codewords?

17   A.   No, it does not.

18   Q.   You mentioned earlier the Texas Instruments

19   contribution. Is that another place -- another example of old

20   news where flag signals were already known before they filed

21   the application for the '835 Patent?

22   A.   Yes, it is. Again, that was about three years earlier.

23   Q.   That's what we see here on the screen again? Is that

24   right?

25   A.   Yes.

1   Q.   Is this Texas Instruments contribution addressing the

2   same issue of how to switch settings that we've been talking

3   about with the ADSL standard?

4   A.   Yes. Again, it's online reconfiguration. So

5   'reconfiguration' means we're making a switch from one set of

6   FIP settings to another, and it's indicating that it's telling

7   us when to make the switch. It's indicating at what -- at

8   what point the parameter should be switched over. So the two

9   units, the transmitter at the central office and the

10   transceiver -- transceiver at the central office and

11   transceiver at the customer premises are in lockstep with each

12   other, because otherwise we lose information.

13   Q.   When Texas Instruments submitted this contribution, to

14   what entity was it submitted?

15   A.   To the ITU.

16   Q.   Is that the very same entity that adopted and published

17   the ADSL standard and the document we've been talking about?

18   A.   Yes, it is.

19   Q.   Did both of those documents talk about using a flag

20   signal switching from one set of settings to another set?

21   A.   Yes.

22   Q.   And is ADSL specific that these settings include FIP

23   settings?

24   A.   Yes, they do.

25   Q.   The next requirement of the claim says "to switch to

1   using for transmission." It says "to switch to a second FIP

2   setting following transmission of the flag signal." Does the

3   ADSL standard document disclose switching to a second set of

4   FIP settings after you've got that flag signal?

5   A.   Yes, it does.

6   Q.   What does it say?

7   A.   Well, it says that this is the dynamic rate adaptation.

8   So 'adaptation' means we're changing something, and it tells

9   us we're doing this adaptation and it will include FIP

10   settings -- the FEC and interleaver settings, which are the

11   FIP parameters.

12   Q.   The next requirement kind of takes a step back to the

13   first FIP values. Do you see that? It says, "the first FIP

14   setting comprises" and has at least one FIP value? Do you see

15   that?

16   A.   Yes.

17   Q.   And does the ADSL standard document say that the first

18   FIP setting includes a first FIP value?

19   A.   Yes, it does. It refers to the error correction coding,

20   the FEC, and the interleaving, so that is the FIP setting.

21   Q.   So we have a first FIP setting that comprises a first FIP

22   value. Is that right?

23   A.   Yes.

24   Q.   And then the next requirement says the second FIP

25   setting, the one you switched into, has a second FIP value

1   that's different from the first. Is that your understanding?

2   A.   Yeah. Again, we're doing adaptation; we're changing for

3   line conditions, so the settings will be different.

4   Q.   So is ADSL, and specifically the part you point to on the

5   screen here, is that talking about having a second FIP setting

6   that's different than the value of the first setting?

7   A.   Yes.

8   Q.   The next part of the claim says that when you make this

9   switch, the switch occurs on something called a predefined

10   forward error correction codeword boundary following the flag

11   signal. What is that talking about, sir?

12   A.   Well, the idea is I need to make the switch between

13   parameter settings, and the only sensible place to make the

14   switch is if I'm changing codeword values or interleaver

15   values. The only sensible place to make that switch is when

16   I'm done with one set and I'm about to start the other set, so

17   that has to be on a codeword boundary. And the standard

18   indicates if the modem operates with the mandatory values,

19   then it will be switching on a superframe boundary, but that

20   superframe boundary will always coincide with a codeword

21   boundary. So that's meeting the requirement that the

22   switching occurs on the codeword boundary. And, you know,

23   it's telling me -- the superframe reference number that's

24   telling me when to do the switch is giving me this predefined

25   boundary.

1   Q.   Does the DRA_swap_request message, the flag signal that

2   you've referred to, does it include as part of that message

3   this superframe reference number, SFR?

4   A.   Yes.

5   Q.   And that middle highlighting says that the superframe

6   reference number identifies around which superframe boundary

7   the rate swap will occur. What is that talking about?

8   A.   Well, that's indicating the point in time there's a

9   superframe boundary and all of the action is happening around

10   that boundary. We've got an old section before the boundary

11   where we've got the old set of parameters, then we've got the

12   boundary at a specified point in time, and then we've got the

13   new setting. So it's telling me that that's the boundary, and

14   it's around this boundary where everything is changing.

15   Q.   And then the last bit of highlighting here says in that

16   the swap always coincides with a codeword boundary. And what

17   is that saying?

18   A.   Well, that says that the switch is happening at a

19   superframe boundary, but it also is occurring near a codeword

20   boundary because the alignment of the codewords and the super

21   frames line up with each other when I use these standard

22   mandatory values.

23   Q.   So when we look back at the claim language which says

24   that this switching we've been talking about occurs on the FEC

25   codeword boundary, does ADSL expressly say that the swap's

1   going to occur at a codeword boundary?

2   A.   Yes, it does.

3   Q.   The last requirement, which is actually the one from

4   claim 10, says that it's the claim 8 we just talked about, but

5   now, "wherein, a first interleaver parameter value of that

6   first FIP setting is different than a second interleaver

7   parameter value of the second FIP setting."

8   And does -- first of all, what is that saying?

9   A.   Well, I think that's refining what was in claim 10 -- in

10   claim 8 where we're changing FIP settings, and this is saying

11   specifically it's not just that you could have changed forward

12   error correction parameters, but claim 10 is requiring that

13   the interleaver parameters need to be the one that are

14   modified. And, here again, you know, the Appendix 1.1 says

15   interleaver settings can be adapted under this dynamic rate

16   adaptation.

17   Q.   So was it already known from this ADSL standard that

18   came, I think you said, some five years before they filed

19   their patent, was it already known to have a first interleaver

20   parameter value be different than the one you're switching

21   into?

22   A.   Yes, it was old technology.

23   Q.   In your professional opinion as an expert in this

24   technology, is claim 10 of the '835 Patent directed to old

25   technology that was already known, or is it directed to

1   something that Mr. Tzannes and Aware invented?

2   A.   It's all old. It's all found in the ADSL standard at

3   G.992.1.

4   Q.   And because it's all found -- well, let me ask this.

5   Because it's all found in the ADSL standard, and we also

6   looked at that Texas Instruments contribution, is claim 10, in

7   your opinion, valid or invalid?

8   A.   Unquestionably it's invalid.

9   MR. BRADLEY: I pass the witness, Your Honor.

10   THE COURT: Cross examination by the Plaintiff?

11   MR. McANDREWS: May we pass out binders, Your Honor?

12   THE COURT: You may.

13   MR. McANDREWS: May I approach, Your Honor?

14   THE COURT: You may approach.

15   Proceed with cross examination when you're ready,

16   Mr. McAndrews.

17   MR. McANDREWS: Thank you, Your Honor.

18   CROSS EXAMINATION

19   BY MR. MCANDREWS:

20   Q.   Good afternoon, Mr. McNair.

21   A.   Good afternoon.

22   Q.   Nice to see you again.

23   A.   Same.

24   Q.   Mr. McNair, is it fair to say that you've been involved

25   with submitting a lot of expert reports and declarations in

1   the past?

2   A.   A number.

3   Q.   And some are in the order of 80 to 90 expert reports

4   you've submitted?

5   A.   That could be.

6   Q.   Okay. And it's fair to say that those have been

7   predominantly on behalf of a defendant or an accused

8   infringer. Is that correct?

9   A.   No, I think it's about 50/50.

10   Q.   So you don't recall testifying that you've done about 80

11   to 90 expert reports or declarations, and the ones that were

12   not IPRs were predominately on behalf of defendants? Do you

13   recall testifying that way?

14   A.   Well, the IPRs were generally on behalf of defendants.

15   The non-IPR expert reports, I think it's a fairly balanced

16   mix.

17   Q.   So do you think that what I just read there is

18   inaccurate?

19   A.   I don't have the -- you know, I don't remember the exact

20   number, but I'd say it's -- I worked on both validity and

21   invalidity, infringement and non-infringement.

22   Q.   Okay. But you've done a significant amount of work to

23   invalidate patents of inventors like Mr. Tzannes. Correct?

24   A.   No, not inventors like Mr. Tzannes. I've -- you know,

25   I've worked for organizations with -- in a lot of different

1   types of organizations.

2   Q.   I'm sorry. Maybe you didn't understand the question.

3   You've done a fair amount of work attempting to invalidate

4   patents. Correct?

5   A.   Well, a fair amount, yes.

6   Q.   Okay. And other than your work in this case, you've

7   never participated in any work relating to the ITU DSL

8   standards. Right?

9   A.   No, I did not.

10   Q.   And you did not submit any contributions to the ITU.

11   Correct?

12   A.   No, I did not.

13   Q.   So you were not one of the 10 engineers at the ITU that

14   worked with Mr. Tzannes to solve real are-world problems, were

15   you?

16   A.   I never worked for the ITU. I never worked with

17   Mr. Tzannes.

18   Q.   Okay.

19   MR. McANDREWS: If we could pull up Exhibit 6,

20   Mr. Diaz, please. And take a look at claim 8. And if you

21   could zoom in. Thank you. And let's take a look at the last

22   element of claim 8 there.

23   Q.   (BY MR. McANDREWS) So it says the switching occurs on a

24   predefined forward error correction codeword boundary

25   following the flag signal. Do you see that?

```
1    A.    Yes.

2    Q.    And it was your opinion -- well, so a forward error

3    correction codeword boundary is known as an FEC codeword

4    boundary.  Correct?

5    A.    Yes.

6    Q.    Okay.  So in order to prove invalidity of claim 10 of the

7    '835 Patent, you would have to show that the prior art that

8    you rely on discloses that the switching in the prior art

9    occurs on a predefined forward error correction codeword

10   boundary, or FEC codeword boundary.  Correct?

11   A.    That's correct.

12   Q.    Okay.  And you testified that that is found in the

13   DRA_swap procedure of 992.1.  Correct?

14   A.    That's right.

15   Q.    Okay.  And I think your testimony suggested that the

16   invention is found in both 992.1.  Correct?

17   A.    Yes.

18   Q.    And if it's not found in 992.1, it would be found in the

19   combination of 992.1 and SC-060.  Correct?

20   A.    That's correct.

21   Q.    Okay.  And, nevertheless, in both of those invalidity

22   theories, I'll call them, you rely on 992.1 for this element

23   of the claim that I have highlighted.  Correct?

24   A.    That's right.

25   Q.    Okay.  Now, the DRA_swap procedure relies on a superframe
```

1   count. Correct?

2   A.   Yes.

3   Q.   Okay. And your testimony that we just heard

4   distinguished between a superframe count and a codeword count

5   to address the negative limitation of the flag signal

6   construction. Correct?

7   A.   Yes.

8   Q.   So you distinguish between a superframe count and a

9   codeword count. Right?

10 A.   That's right.

11 Q.   Okay. Nevertheless, you -- so your opinion is that the

12 superframe counter of 992.1 is not a codeword counter. Right?

13 A.   That's correct.

14 Q.   Okay. So the claim, again, requires that the switch

15 occurs on a predefined forward error correction codeword

16 boundary. Right?

17 A.   Yes, it does.

18 Q.   But that's not what G.992.1 discloses. Correct?

19 A.   That's not true.

20 Q.   Okay. And, in fact, it discloses that the -- you

21 indicate -- so the swap, the DRA_swap is the equivalent of

22 what you would call the switching in the claim. Right?

23 A.   Yes.

24 Q.   Okay. And that swap, the DRA_swap, it actually occurs

25 around a superframe boundary, doesn't it?

1   A.   It occurs at a superframe boundary.

2   Q.   Well, the language of the standard is actually that it

3   switches around a superframe boundary. Correct?

4   A.   No, the language of the claim is -- it indicates the

5   superframe boundary around which the switch will occur, but

6   it's occurring at the superframe boundary.

7   Q.   Okay. So you agree with me it says 'around which'; it

8   doesn't say 'on which'--the standard.

9   A.   That's correct. It says 'around which'.

10   Q.   And you agree with me that the swap does not occur on an

11   FEC codeword boundary, but, instead, occurs on a superframe

12   boundary. Right?

13   A.   It occurs on an FEC codeword boundary because the FEC

14   codeword boundary coincides with a superframe boundary.

15   Q.   Could you open your binder to page 153 -- I'm sorry.

16   This is behind tab 1. And if you can go to -- it will be

17   page 39 behind tab 1, but this document has multiple pages,

18   so you're looking for page 153.

19   A.   Yes, I've got 153.

20   Q.   Okay. And this is your prior testimony. Right?

21   A.   Yeah, this is my deposition.

22   Q.   And it was under oath. Right?

23   A.   Yes.

24   Q.   Okay. And the question to you was, "And the swap occurs

25   on a superframe boundary, then."

1   Answer: "That is my understanding."

2   Did I read that correctly?

3   A.   Yes.

4   Q.   Okay. And it says, "Okay. The swap doesn't occur on an

5   FEC codeword boundary. Correct?"

6   "No" was your answer.

7   Did I read that right.

8   A.   That's what I said.

9   Q.   Okay.

10   MR. McANDREWS: Now, if we could bring up Exhibit

11 257, please. And let's blow up the top half. There you go.

12 Thank you.

13 Q.   (BY MR. McANDREWS) So your testimony earlier, you know,

14 we've referred to this as the SC-060 document. Correct?

15 A.   I call it the Texas Instruments contribution, but it's

16 the same thing.

17 Q.   And that's exactly my point. I was going to ask you,

18 it's true that you and counsel for CommScope emphasized the

19 fact that this document was authored by Texas Instruments.

20 Correct?

21 A.   Well, it was, but it's also called 'temporary document

22 SC-060,' as I mentioned.

23 Q.   And we can all agree--Texas Instruments, very good

24 company, has some very smart ideas. Right?

25 A.   Yes.

1   Q.   Okay. But did you -- so what you're suggesting, though,

2   in this instance is that Mr. Tzannes took his idea from Texas

3   Instruments. Correct?

4   A.   I don't know where he got his idea from, but I know that

5   this Texas Instruments contribution was before the patent was

6   filed.

7   Q.   Okay. And you're suggesting that this is where the sync

8   flag came from. Correct?

9   A.   Well, specifically he mentioned the sync flag idea came

10   from ADSL2, but it's also here in the Texas Instruments

11   contribution.

12   Q.   Okay. And this is dated August 2001. Correct?

13   A.   Yes.

14   Q.   Okay. And the suggestion is that Texas Instruments had

15   this idea before Mr. Tzannes had this idea to use a sync flag.

16   Right?

17   A.   And so did ADSL2, yes.

18   Q.   Okay. Now, did you study this document as part of your

19   work?

20   A.   Yes, I did.

21   Q.   Okay. Did you happen to see the last line of that first

22   paragraph there--"abstract"?

23   MR. McANDREWS: Mr. Diaz, if we could highlight --

24   THE WITNESS: Yes.

25   Q.   (BY MR. McANDREWS) It says, "This proposal merges

1   agreements with concepts from prior contributions," and one of

2   those is RN-046. Do you see that?

3   A.   Yes.

4   Q.   Okay. Could you take a look at tab 4 of your binder? Do

5   you have tab 4?

6   A.   Yes.

7   Q.   And tab 4 is a document, at the top it says 'RN-046'.

8   Correct?

9   A.   Yes.

10 Q.   Okay. And it's dated May 2001. Is that right?

11 A.   That is.

12 Q.   Okay. So it's before this August contribution that you

13 refer to as the Texas Instruments document. Correct?

14   MR. BRADLEY: Object to use of this document. It's

15 not an exhibit, it's not on the list, and he's not using it

16 for impeachment.

17   THE COURT: What's your intended use of this?

18   MR. McANDREWS: It's to impeach the witness on the

19 source of the sync flag, Your Honor.

20   THE COURT: Is this witness the author of this

21 document?

22   MR. McANDREWS: No; Mr. Tzannes is.

23   THE COURT: You can't impeach this witness with

24 Mr. Tzannes' prior statements. It's got to be a prior

25 inconsistent statement of the witness.

1   MR. McANDREWS: Okay.

2   Q.   (BY MR. McANDREWS) Mr. McNair, were you aware --

3   THE COURT: I'll sustain the objection.

4   MR. McANDREWS: Thank you, Your Honor.

5   Q.   (BY MR. McANDREWS) Mr. McNair, were you aware that the

6   sync flag that is referenced in the Texas Instruments document

7   actually came from Mr. Tzannes?

8   THE COURT: You need to pull this off the screen,

9   too. Go.

10   Ahead and restate your question, please, Mr. McAndrews.

11   Q.   (BY MR. McANDREWS) Mr. McNair, were you aware that the

12   sync flag referenced in the Texas Instruments document

13   actually came from Mr. Tzannes?

14   A.   I don't know that for a fact.

15   Q.   Thank you.

16   MR. McANDREWS: Pass the witness.

17   THE COURT: All right. Is there redirect,

18   Mr. Bradley?

19   MR. BRADLEY: Yes, Your Honor.

20   THE COURT: All right. Proceed with redirect.

21   REDIRECT EXAMINATION

22   BY MR. BRADLEY;

23   Q.   Mr. McNair, for purposes of your invalidity opinions, are

24   you relying on the prior ADSL and Texas Instruments

25   contributions, meaning prior to the '835 Patent?

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 1    A.    Yes.

 2    Q.    Sir, do you know -- does it matter where Mr. Tzannes may

 3    or may not have gotten his idea from, so long as it's actually

 4    in those old documents that came years before?

 5    A.    It doesn't make any difference from where it came from.

 6    It's prior to the patent application.

 7    Q.    And is it your opinion that every single requirement of

 8    claim 10 is set out expressly in the ADSL standard by itself?

 9    A.    Yes.

10    Q.    And is it also your opinion that every single requirement

11    of claim 10 is set forth in that ADSL standard combined with

12    the flag signal as a second alternative that we saw from the

13    Texas Instruments contribution?

14    A.    Yes.

15    Q.    Is there any doubt in your mind that claim 10 is invalid

16    and they were not entitled to get that?

17    A.    None whatsoever.

18    Q.    Sir, if the Patent Office had the ADSL standard or the

19    Texas Instruments contribution, do you think they might have

20    reached a different result?

21    A.    I believe they would have.

22    Q.    Do you think they would not have allowed claim 10?

23    A.    I believe they would have disallowed it.

24              MR. BRADLEY:  Pass the witness, Your Honor.

25              THE COURT:  Additional cross examination?
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1   MR. McANDREWS: No, Your Honor.

2   THE COURT: All right. You may step down,

3   Mr. McNair.

4   MR. BRADLEY: Your Honor, may Mr. McNair please be

5   excused?

6   THE COURT: Any objection from Plaintiff?

7   MR. McANDREWS: No, Your Honor.

8   THE COURT: All right. Mr. McNair, you are excused.

9   You're free to stay with us; you're also free to leave. It's

10   up to you.

11   All right, ladies and gentlemen, we're going to stop for

12   the day. The next witness is something over an hour in length

13   and it's 20 minutes until 6:00. It's been a long day. I

14   appreciate your attentiveness.

15   I'm going to ask you as you leave the courtroom to go

16   through the jury room and leave your notebooks closed and on

17   the table there so they'll await you there in the morning.

18   Please remember to follow all my instructions, including not

19   to discuss the case with anyone else, including the eight of

20   yourselves.

21   We'll reconvene in the morning at 8:30 just like we've

22   been doing. You're doing exceptionally well there, so I'll

23   leave it in your capable hands to be there and be ready to go

24   at that time. Please travel safely to your homes. Have a

25   good evening.

1   The jury's excused until tomorrow.

2   (Whereupon, the jury left the courtroom.)

3   THE COURT: Be seated, please.

4   Counsel, according to the Court's records, the Plaintiff

5   has 1 hour and 43 minutes of remaining trial time. The

6   Defendant has 4 hours and 15 minutes of remaining trial time.

7   I fully expect to get all the evidence in tomorrow.

8   Also, as I previously instructed, you submitted by email

9   by 3:00 today an updated and revised submission regarding the

10   final jury instructions and the verdict form. I have a couple

11   of additional things I want you to do. By 10:00 this evening

12   I want an email from both parties setting forth the following,

13   just so there will be no question and I'll have a clear

14   rendition of the same in front of me.

15   I want a list of each accused product, specific name and

16   model number; I want clarification as to which patents the

17   Defendant says are standard essential and which patents are

18   not standard essential; I want a clear indication from TQ

19   Delta whether the $89 million they are seeking in damages is

20   sought as a lump sum or as a running royalty, and if a running

21   royalty, at what rate; and then I want a statement or some

22   support from CommScope as to the basis for their proposed

23   instruction on RAND on page 32 of the current draft of the

24   proposed jury instructions. There's no indication as to why

25   they believe that proposed instruction is supported by the

1   law, and I need to see something on that. And again, I want

2   that from both sides by 10:00 this evening.

3   All right. Are there questions from either Plaintiff or

4   Defendant before we recess for the evening?

5   MR. DAVIS: No, Your Honor.

6   MR. DACUS: We don't have a question, Your Honor.

7   I think we did have a short proffer we need to do, whenever

8   the Court directs us to, with respect to the source code

9   information that was excluded by Your Honor. We can do it

10   now or --

11   THE COURT: You are talking about during pretrial?

12   MR. DACUS: Yes, Your Honor.

13   THE COURT: Okay. Well, this is the first time you

14   raised it with me. We will raise it sometime before the trial

15   is submitted to the jury and outside of their presence.

16   MR. DACUS: Understood.

17   THE COURT: Mention it again to me in the morning

18   before I bring the jury in. I'll expect you-all to meet and

19   confer, as you have been doing, with regard to overnight

20   disputes. As I told you this morning in chambers, you're

21   getting better about giving me a complete record to work from,

22   but it's not perfect. Continue to improve there. Or as an

23   alternative and better yet, just resolve your objections so I

24   don't have to worry about them. But whatever the case, I'll

25   be available in chambers in the morning, as we have done

1   throughout the trial, to save you time, to maximize your

2   designated trial time, and to give you guidance in advance of

3   the jury being present about any issues you can't resolve

4   overnight.

5   When I mentioned the email about the proposed RAND

6   instruction in the current draft of the proposed final jury

7   instructions, I said page 32. I think it runs over to page 33

8   as well. But you know what I'm talking about. I want to see

9   some law supporting that, or alternatively from the other side

10   some law indicating that's not a proper instruction. I'll

11   hear from both sides on that, and I'll look for that in that

12   jointly submitted email by 10:00 this evening.

13   All right, are there other issues that we need to discuss

14   before we recess for the day?

15   MR. DAVIS: No, Your Honor.

16   MR. DACUS: No, Your Honor.

17   THE COURT: We stand in recess until tomorrow

18   morning.

19   (The proceedings were concluded at 5:45 p.m.)

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1   I HEREBY CERTIFY THAT THE FOREGOING IS A

2   CORRECT TRANSCRIPT FROM THE RECORD OF

3   PROCEEDINGS IN THE ABOVE-ENTITLED MATTER.

4   I FURTHER CERTIFY THAT THE TRANSCRIPT FEES

5   FORMAT COMPLY WITH THOSE PRESCRIBED BY THE

6   COURT AND THE JUDICIAL CONFERENCE OF THE

7   UNITED STATES.

8

9   S/Shawn McRoberts   03/22/2023

10   _____DATE_____
           SHAWN McROBERTS, RMR, CRR
11   FEDERAL OFFICIAL COURT REPORTER

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